

SPECIAL REVIEW ISSUE!
New '90s Columns See pp. 48, 88, 124
AMIGA WORLD
January 1990
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# DIGI·VIEW GOLD 4.0

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This image was photographed directly from an Amiga 1080 Monitor and shows the new 4096 color Dynamic HiRes Mode available with Digi-View 4.0.

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**Full Featured**

PageSetter II is easy to learn and simple to use. Import text from any Amiga word processor or type directly onto your page. Use multiple type faces and type sizes. *You can even fill text with user specified patterns.*

Import bitmap graphics from any Amiga IFF paint program and structured graphics from Professional Draw. PageSetter II will automatically convert your graphics into high quality grey scaled images.

**Based on Professional Page**

Gold Disk PageSetter II is based on Professional Page - the leading DTP package on the Amiga - and features many of the same powerful capabilities and the same high level of reliability.

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Because PageSetter II uses the same AGFA Compugraphic Outline fonts as Professional Page, you can ouput your pages at the highest resolution of any preference supported printer. This means you get smooth, jaggie-free, text and graphics regardless of the type of printer - dot matrix, inkjet, or laser.

**Key Features**

*Layout:*

- Page sizes to 8-1/2" x 14"
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- Rulers, grids, columns, margins




Quickly combine text and graphics for dynamic results

*Text:*

- AGFA Compugraphic Fonts.
- Import text from most Amiga word processors.
- Point sizes from 1 to 127 points
- Bold, Italic, Underline, Outline, Superscript, Subscript, and user definable pattern fills
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**Bold** *Italic* Underline Outline PATTERN

AGFA Compugraphic Fonts mean no more jaggies

*Graphics:*

- Import any IFF graphic.
- Import Professional Draw Clips
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**Gold Disk PageSetter II is available for $129.95. Current PageSetter owners can upgrade for $59.95. If you are a registered owner, please call 1-800-387-8192 to upgrade; otherwise, send payment with manual cover or program disk.**

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Gold Disk Advantage is the most powerful integrated spreadsheet, database, and business presentation package on the Amiga.

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| Feature Comparison | | |
|---|---|---|
| | **Gold Disk Advantage** | **Maxi Plan** |
| Max size | 65000 x 65000 | 512 x 32760 |
| # of sheets | Unlimited | 3 |
| # of graphs | Unlimited | 8 |
| Max graph colors | 16 | 8 |
| # of views | Unlimited | No |
| Sideways Printing | Yes | No |
| # of funcs | 90+ | 66 |
| ARexx | Yes | No |
| **Performance Comparison** | | |
| Redraw | 0.87 | 2.35 |
| Save | 2.23 | 5.33 |
| Load | 3.84 | 6.69 |
| Recalc | | |
| First | 2.44 | 5.15 |
| 2nd* | 0.19 | 4.30 |
| 2nd** | 2.24 | 4.88 |
| Memory | 43216 | 69832 |

* With no changes in sheet;** With changes made to sheet
Tests on 1 Mb Amiga; Spreadsheet: 9 rows x 44 columns

Gold Disk Advantage is available for $199.95. If you own any other spreadsheet you can upgrade for only $100. Please send payment along with the cover page of the spreadsheet manual.




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Circle 87 on Reader Service

VOLUME 6, NUMBER 1 JANUARY 1990

# ·C·O·N·T·E·N·T·S·

## FEATURES



## ARTICLES

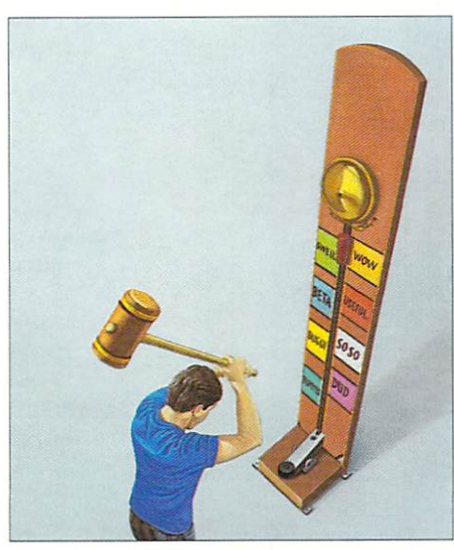


## COLUMNS



## DEPARTMENTS






*We'll help you test the competitors this month in our* ***Special Review Issue****. We've got feature reviews of optical scanners and Commodore's new Bridgeboard, head-to-head comparisons of hard-disk systems, word processors, communications packages, utilities, and DOS conversions, plus straight-up reviews of CAD programs, MIDI sequencers, and more. Dig in!*



## REVIEWS



## GAMES



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MEREDITH BICKFORD, *Advertising Coordinator*
GIORGIO SALUTI, *Associate Publisher, West Coast Sales 1-415-363-5230*
*2421 Broadway, Suite 200 Redwood City, CA 94063*
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# *Before you buy an A2500*

# READ THIS FIRST!

*(or before you even add a hard drive to your A2000)*

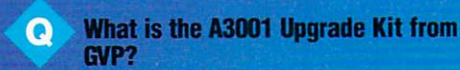
**Christmas Special**
Free copy of *Turbo Silver 3.0* with purchase of A3001 upgrade kit

**Upgrade your A2000 to an "A3000 (PLUS 1)" TODAY! With the 25~~M~~hz 28 Mhz 68030, A3001 Upgrade Kit from GVP**

40MB or 80MB Hard Disk Drive
Up to 8MB of 32-Bit Wide DRAM
Hard Disk Drive Interface
Autoboot EPROMS for Hard Disk
Optional 68030 Boot EPROMS (UNIX, etc.)
32-Bit 68030 Bus Interface
2~~5~~Mhz 68030 CPU with oscillator
2~~5~~Mhz 68882 FPU

28 Mhz

28 Mhz STANDARD



**Q What is the A3001 Upgrade Kit from GVP?**

**A** The A3001 Upgrade Kit includes the following:

- 2~~5~~Mhz 68030 accelerator board for the A2000.
- Factory installed 2~~5~~Mhz 68882 Floating Point Processor.
- 4 or 8MB of 32-bit wide high performance 80ns NIBBLE MODE DRAM.
- Built-in AUTOBOOTing HIGH PERFORMANCE hard disk controller.
- Quantum 40MB or 80MB hard disk drive with an average read access time of 11ms (19ms on write) and 64KB read-ahead cache. If you already own a hard disk, this item can be optional.

**Q What does the A3001 really do for my A2000?**

**A** The A3001 provides the following, UNBEATABLE and UNMATCHED features:

- The world's fastest (and shipping in volume!) accelerator board for the Amiga.® The 68030 CPU includes an on-chip MMU and separate data and instruction caches. According to a recent review in the German "Amiga Magazin," performance is between TWO AND THREE TIMES FASTER THAN THE A2500.
- One of (we are being modest!) the world's fastest hard disk controllers. Measured with "diskperf2," data transfer rates of well over 700KB/sec are achieved. Of course this is not surprising as the hard disk controller is built-in directly on the 32-bit bus of the 68030 accelerator board!
- The up to 8MB of 32-bit wide DRAM is fully DMA-able (can be directly accessed by any DMA device) and is automatically AUTOCONFIGured. The A2500 is limited to only 4MB of (slower) 32-bit wide DRAM.
- GVP's unique DRAM design uses state-of-the-art 80ns NIBBLE MODE DRAMs, which allows full support and advantage to be taken of the 68030's BURST mode. In fact during burst mode, this amazing design manages to achieve an average of ZERO WAITSTATES even at 2~~5~~Mhz! This DRAM design is similar to that used in Steve Jobs' NeXT® machine, although that design (according to the BYTE magazine review) uses more CPU waitstates at 2~~5~~Mhz!
- 68000 fallback mode allows the 68030 CPU to be disabled, to ensure full compatibility with timing sensitive applications (e.g.: some game programs).
- Sockets are included for 68030 BOOT EPROMs, allowing future flexibility for running other operating systems.
- GVP's unique ASYNCHRONOUS design means that the 68030 has its own dedicated oscillator and runs completely ASYNCRONOUS to the rest of the A2000. This means better GENLOCK compatibility (not as sensitive to motherboard clock source) as well as providing the ability to run at any clock speed completely independently of the A2000 motherboard, limited only by the access speed of the DRAMs being used.
- For the REAL, math intensive, number-crunching fanatics there is an optional oscillator socket, allowing the 68882 FPU to be independently clocked at even higher speeds (e.g.: 33Mhz).
- ZERO SLOT SOLUTION! With the full-blown configuration installed (2~~5~~Mhz 68030 & 68882, 8MB of 32-bit wide RAM and one or two AUTOBOOTing 40MB or 80MB hard disks), the A3001 STILL LEAVES ALL THE A2000 EXPANSION SLOTS FREE FOR FUTURE EXPANSION! The only slot in the A2000 which is used is the Co-processor/CPU slot. An equivalently configured A2500 would use an additional TWO valuable expansion slots!

**Q This sounds great, but what if I can't afford to buy the full A3001 kit now and all I need urgently is a hard disk drive for my A2000?**

**A** GVP also offers an "a la carte" approach to purchasing the A3001 kit. For example if you are about to purchase a hard disk drive and controller for your A2000, for only a little more you could instead buy the GVP 2~~5~~Mhz 68030 accelerator board with its built-in AUTOBOOTing hard disk controller and the 40MB hard disk (suggested list price for both is only $1495). You would obviously not get the full performance increase mentioned above, until you added our 32-bit wide RAM daughterboard and the 68882 FPU. However, in this case your initial hard disk outlay is not lost and it can be regarded as a "down payment" on your full-blown 32-bit workstation! If you are working on a REALLY tight budget, call us and ask about our "A2501" upgrade kit for the A2000, which outperforms the A2500 with its 16Mhz 68030! This is also available in "a la carte" form!

**Q Why did GVP call this the A3001 upgrade kit?**

**A** The A3001, stands for "A3000 PLUS 1"! Yes, we believe that this solution offers everything the "A3000" may offer PLUS...!

**Why wait, upgrade your A2000 to an A3001 today!**




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# CHIEF CONCERNS

*Ready to fight.*



ON MARCH 15, 1990 in Washington, DC, *AmigaWorld* magazine will stick its neck out. We are going to do something that needs to be done, and should have been done long ago.

That is the day that we will form the Amiga Developers Association, a group whose aim is to spread the gospel of Amiga to a world of uninitiated, uninspired computer users, journalists, and other good-for-nothings. The group will also serve as a united voice that can make articulate and specific requests of Commodore.

If it fails, blame Mike Halverson of Impulse. It was his idea. If it works, well, we'll be happy to steal all the credit. Sorry, Mike!

The more we think about it, and the more people we talk to, the less risky it all seems. Amiga developers and users are a vocal and committed bunch that deeply wishes for more success. And Commodore has awakened from four years of hibernation and is now rested, strong, and ready to fight. We believe that a united Amiga community and an invigorated Commodore can shake things up immensely in the PC business.

So here's the plan. *AmigaWorld* will gather together for an initial meeting Amiga developers and users whose livelihoods depend on this fine machine. If you want to come, and are serious about joining the Association, then join us at the Sheraton Hotel in Washington, DC on the morning of March 15 (the day before AmiExpo). Here we'll elect an executive committee that will consist of prominent developers (lowly magazine people like ourselves are barred from this esteemed group). This executive board will respond to surveys (they will have been sent out long before) from prospective members that will help in setting an agenda, devising a game plan, and figuring out how much this stuff is all going to cost. Only then will they determine a dues structure.

That means it will be absolutely free to join. In fact, you'll come out ahead because we'll feed and give nearly unlimited beverages to those attending the first meeting.

Our plan is to lose money by subsidizing this group. Yeah, I know that's a real nice thing to do, but we think that a growing market is better for business, so don't go feeling too sorry for us. We'll do just fine.

The charter of the organization will be created by the organization. We do have some ideas for the charter, though, which explain why we are doing this in the first place. Here's a brief explanation. For four years, the Amiga community has relied upon Commodore to do its marketing, its public relations, and all the rest. Nobody I've talked to had been satisfied with the results. . .until recently.

Now there is a new crew at Commodore that is spending bucks and doing some really smart things. We like these new folks tremendously, but they shouldn't go it alone, and we should not hang our futures entirely on their work. Therefore, we see the ADA doing two primary things. First, it is a voice to the outside world. Here's a "for instance." In its Oct. 9, '89 issue, *Businessweek* published a special report on multimedia. It talks about Apple, IBM, and the NEXT machine (which wasn't even finished when the article came out). On page 5 of that article, there is a paragraph about the Amiga. It accurately called the Amiga the leader in this market. Why on earth did it take five pages to get to the leader? ADA, had it been in existence, would have given *Businessweek* a position paper on Amiga multimedia technology, a list of product vendors, and a list of people who use those products. It would have inundated *Businessweek* with letters and phone calls asking why the Amiga got only one lousy paragraph. It would do the same for any other magazine that neglects the Amiga where it shines. Believe me. Next time they won't be so blind.

Secondly, ADA will also tell Commodore what it needs to do (the folks down there are really, truly, and sincerely receptive to this group). If the industry believes that Commodore's top priority should be higher resolution, it will say so. A lower-priced A500? It will say that too!

We think we can create a united Amiga community that is ready to fight, ready to grow, and ready to slap around smart-mouthed snobs from other markets. And if it works, we will all benefit from more products at lower prices. ■

Doug Barney

## Hard-Disk-On-A-Card

# THE BEST JUST GOT BETTER

*Now we have added 2MB of Zero-Waitstate FAST RAM Expansion to our best-selling Hard-Disk-On-A-Card!*

**External SCSI connector for attaching additional external SCSI devices**

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**SAVES EXPANSION SLOT** Now you can have a high performance SCSI controller and 2MB of Fast RAM expansion in a single A2000 expansion slot.

**SAVES A PERIPHERAL BAY** Saves a valuable peripheral bay by mounting the hard disk directly (flush) on the SCSI/RAM controller board.

**PERFORMANCE** With close to 10,000 Amiga hard disk controllers installed, our performance and reliability needs no further explanation. Our unique DMA direct to onboard 16KB buffer has received rave reviews around the world. Don't ask us, just ask one of our many satisfied customers! Very FAST AUTOBOOTing directly off a hard disk FAST FILE SYSTEM partition, is a standard feature.

**EXPANDABILITY** By saving both a valuable expansion slot as well as a scarce peripheral bay, your Amiga retains maximum expandability.

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**PRICE** Priced less than most single function controllers. No matter how you look at it you get unbeatable value. Look at the 2MB FAST RAM expansion capability as an (almost) free bonus.

**QUALITY** All GVP products are backed by our full one year warranty.

**NEW!**




### IMPACT WT-150 Streaming Tape Backup *

Experienced computer users know the importance of making regular backups. A typical 40MB hard disk will take over FORTY-FIVE 880K floppy disks to back-up. The job can easily take over an hour of repetitive disk swapping. There is a better way!

The NEW GVP IMPACT WT-150 Streaming Tape Backup product offers a high capacity (150MB), high speed, streaming tape drive bundled with probably the best and most flexible backup tape software utility in the industry. This incredible piece of software, which we have called ***TapeStore,***™ makes backups simple, interesting and exciting.

***TapeStore*** can back-up and restore everything from individual files (File-by-File mode) to entire disk partitions (Disk Image mode). Support for the portable, industry standard, Unix tape format (tar) is planned for the near future.

***TapeStore*** is designed for novices and experts alike: it can be run from the workbench or the CLI. It can be operated using a few simple mouse clicks for daily back-ups, or used to create archive tapes for transferring large amounts of information between machines. Anyone can supply a piece of hardware but ONLY GVP provides the TOTAL SOLUTION. Once again GVP has come up with a winner!






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* GVP SCSI host adapter required

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# REPARTEE

*Comments, complaints, and concerns*

*from* AmigaWorld *readers.*

## CONCERNING THE CHIEF

TO DOUG Barney:

Where'd they dig YOU up? After reading your column in the November '89 *AmigaWorld* ["Chief Concerns," p. 6], I get the distinct impression that you think the Amiga should be aimed at yuppies and that MS-DOS machines are the worst computers on the planet. You will find that computer bashing does *not* work, Doug.

Next month, I was planning to get an A2000, but if Commodore can't market the machine, then I don't want it.

I agree that the MS-DOS world is a tangled web of incompatibility, but there are 12 million machines in place. My AT runs everything under the sun. Don't jump on owners of other machines just because Commodore has marketing problems.

Look, I don't say that an AT clone is God's gift to mankind. It can't do everything. Color Macs can't do it all either, but please don't bash a machine that has an installed base 12 times larger than the Amiga's.

I will most likely get my A2000 along with all the other hardware I need to make it go as fast as possible. But if you think I'm going to change my whole outlook on life just because I have an Amiga, then you're wrong. Stop this computer bashing NOW, because it won't do you or Amiga users any good.

**Jay Thomas**
*White Bear Lake, MN*

REGARDING YOUR Chief Concerns column in the November '89 issue of *AmigaWorld*, BRAVO! It does my heart good to see *AmigaWorld* taking this position.

I, and thousands of other Amiga users, have known all along that this machine could knock the memory chips right out of any other machine, but even our most devout Amiga magazines have not said it quite so passionately.

**Rick Wilson**
*Marysville, OH*

IN YOUR "First Impressions" column [Oct. '89, p. 6], you talk about how advanced the Amiga is and how much it can do. But why is it that the Mac sells so much better? I live on a college campus where every other room has a Macintosh. Recently, I used one and was amazed by its lack of ability. I used MacPaint, and found it to have about five percent of the capabilities of DeluxePaint III. The Amiga is faster, has 4096 colors, a higher resolution, and can multitask. Why isn't it selling as well as the Mac?

The Amiga's biggest drawback is that it was bought by Commodore. There are so many things that Commodore could do to improve the Amiga. Apple and IBM give good service, and they're reliable. That's what people buy.

People want something that's reliable. Reliability is when you buy a computer and feel as if you are buying into a company. When you buy a Commodore, you buy a machine. Don't get me wrong. I think the Amiga is great; it's just unfortunate that Commodore isn't.

**Lok Ho Wong**
*Durham, NC*

## DEALING WITH DEALERS

I THINK THAT the fundamental reason for the Amiga's poor sales record can be found by looking no further that our local dealers.

On a recent coast-to-coast trip, I visited about thirty computer retailers. Without exception, the Apple and IBM (and clones) retailers had a professional staff, and in general, inspired confidence in the products being sold. Contrast that to the Amiga dealers I saw: staff, if it could be found, was more interested in playing with the computer than in helping the customer; the stores, with one exception, were in disarray.

Wherever I attempted to buy Amiga products, they were back-ordered, waiting for shipments from Commodore, etc. In other words, I got excuses, not performance.

Not one Amiga store had a laser printer operating (so much for desktop publishing); not one had a word processing program on hard disk; not one had an Amiga with hi-res graphics, flickerFixer, large monitor, and plotter to demonstrate CAD programs. All had games and videos running, though.

So, fellow Amiga users, if you want to see the Amiga receive better recognition in the business market, get after your local dealer to clean up his or her act.

**J. Vander Brook**
*Cheyenne, WY*

## FRIENDS OF AMIGANAUTS

CHEERS TO YOU for picking up on the wonderful talents and humor of Susan Ishida in your November '89 issue [p. 35]. For the past couple of years she has been entertaining the members of our Amiga Friends group with the offbeat adventures of Jason and the Amiganauts. It was a splendid surprise to find Jason and friends gracing the pages of your magazine.

**Rick Jones**

Send your letters to: Repartee, *AmigaWorld* Editorial, 80 Elm St., Peterborough, NH 03458. Letters may be edited for space and clarity. ■

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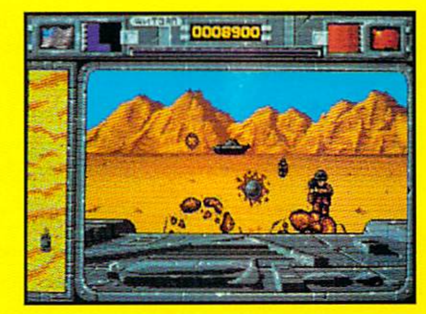
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# NOTEPAD

Compiled by Barbara Gefvert Tyson



Before you jump into combat, hop into an Amiga cockpit.

## *Defense Hotshot*

THE ISRAELI AIR Force needed a new type of combat simulator for its fighter pilots. Traditional flight simulators were large, expensive, difficult to run, and poor real-time dogfight trainers. For help, the Israeli government turned to Loral Defense Systems in the U.S., and to the Amiga.

Together with the Israeli company BVR, Loral developed a compact, inexpensive, user-friendly air-combat simulator, called the HOTSHOT Combat Tactics Trainer. HOTSHOT consists of an F-16C Fighting Falcon or F-15 Eagle jet fighter cockpit, enclosing a pilot seat, instrument panel, and control stick. Of the five computers that power HOTSHOT, three are Amiga 2000s.

Directly in front of the HOTSHOT control panel is a 19-inch color monitor driven by a Silicon Graphics computer. The monitor is the pilot's heads-up-display (HUD), providing a view of the computer-simulated flight. The HUD uses filled vector graphics and is quite detailed, down to displaying different aircraft types and all avionics displays of a real jet fighter.

Beside the cockpit is an Apollo 3500 minicomputer that feeds information to the other four computers through a custom-designed bus. It also serves as an instructor's station and comes with a four-meg, hard-disk-equipped A2000 and Commodore 1084S monitor. This A2000 is the HOTSHOT's controller, containing the database of enemy aircraft and previously run missions. The other two Amigas control the radar and radar warning displays.

To fly the simulator, trainees select the mission parameters with the mouse and menus, then take off. They can fly missions against MIG-21s or MIG-29s, and against multiple threats equipped with differing weapons' systems and skill levels. Simulators based in potential trouble-spots around the world may be configured for specific enemy aircraft/weapon types, letting pilots practice in tailor-made scenarios before the real shooting begins.

"The Amiga was chosen because it's good at generating displays and color graphics," says Loral spokesman Andy Jansen. "The entire system is made up of off-the-shelf components for low cost and easy maintenance."

Considering that larger, more complex simulators run in the $10-million range, an Amiga-equipped HOTSHOT is quite inexpensive. Each simulator costs about five percent of the norm, while offering vastly superior performance. *—Kevin C. Rohrer*




## *Cracklings Galore from Commodore*

In a keynote address at the October Software Publisher's Association Conference in Montreal, Canada, Commodore International Chairman Irving Gould discussed the role of multimedia in the industry. "The Amiga is ideal for the emerging multimedia market," Gould said.

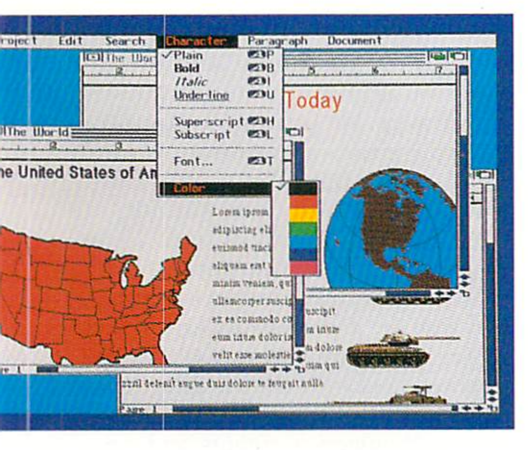
The Amiga is also apparently the ideal platform for expansion, as Commodore has just announced a group of new products, including two peripherals for the A2000 series: The A2091-40 autobooting 40MB SCSI hard-disk controller with sockets for two megs of RAM, and the A2232 card with seven serial ports. The A1011 external 3½-inch drive promises transfer rates up to 250K per second, and the new A2500/30, an Amiga 2500 with a Motorola 25 MHz 68030 processor, 68882 math coprocessor, plus two megs (expandable to four) of RAM is aimed at graphics, animation, and video pros.

Wonder where support for your Aegis products will come from now that Aegis has dissolved? Oxxi (PO Box 90309, Long Beach, CA 90809, 213/427-1227) has acquired both the Aegis and Sparta lines and will sell and support all products.

Don't miss the Amiga in Nevada this month (Jan. 6–9) at the Winter Consumer Electronics Show. As usual, CES will be held at the Las Vegas Convention Center. Call 202/457-4919 for information. *—BGT*

# ProWrite 2.5, The Best Amiga Word Processor. Guaranteed.

| Feature | ProWrite | excellence | Pen Pal | Kind Words | Scribble |
|---|---|---|---|---|---|
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| Color Pictures | ✓ | ✓ | ✓ | ✓ | |
| Wrap Text Around Pictures | ✓ | | ✓ | | |
| WYSIWYG Display | ✓ | ✓ | sometimes | ✓ | |
| Spelling Checker | ✓ | ✓ | ✓ | ✓ | ✓ |
| Mail Merge | ✓ | ✓ | ✓ | ✓ | ✓ |
| Typing Speed | fast | slow | medium | slow | medium |
| Spell Check as You Type | ✓ | ✓ | | | |
| Simultaneous Text and Graphics Printing | ✓ | | ✓ | | |
| Automatically Adjust to Printer's Capabilities | ✓ | | | | |
| PostScript Support | optional | ✓ | | | |
| Paragraph Sorting | ✓ | | | | |
| User Definable Defaults | ✓ | | | | |
| Can Multi-Task with 1 Meg of Memory | ✓ | | | ✓ | ✓ |
| Suggested Retail Price | 124.95 | 299.95 | 149.95 | 99.95 | 149.95 |
| **Guaranteed Bug Free*** | ✓ | | | | |




ProWrite is the most reliable full-featured Amiga word processor—and it's the only one that's guaranteed. Look at the chart again. It highlights just a few of the features you get with ProWrite 2.5.

Unlike other word processors, ProWrite *can* use multiple fonts, *can* place graphics next to multiple lines of text, *can* keep up with your typing, *can* check spelling as you type, *can* multi-task with just one meg of memory, and *does* have that solid Amiga feel. And we support our product better than anyone.

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# REVIEWS

## Pen Pal

## ProWrite 2.5

*Good, quick prints, and more.*

**By Loren Lovhaug**

TO AVOID RELYING on the inferior fonts built into older printers, designers of Amiga word processors have traditionally chosen to render documents as page-sized pictures, using Amiga screen fonts for text. This approach makes it easy to incorporate IFF images within documents, gives you a huge selection of fonts, and because the output is simply a screen dump, provides WYSIWYG (What You See Is What You Get) convenience.

The quality of fonts resident in today's printers, however, surpasses that of Amiga screen fonts. Even nine-pin dot matrix units offer attractive near-letter-quality fonts, and outputing with printer fonts is much faster than printing graphics-based documents.

Two new packages, Pen Pal from Brown Wagh and New Horizon's ProWrite 2.5, are on the way to bringing Amiga owners the best of both of these worlds.

### Pen Pal

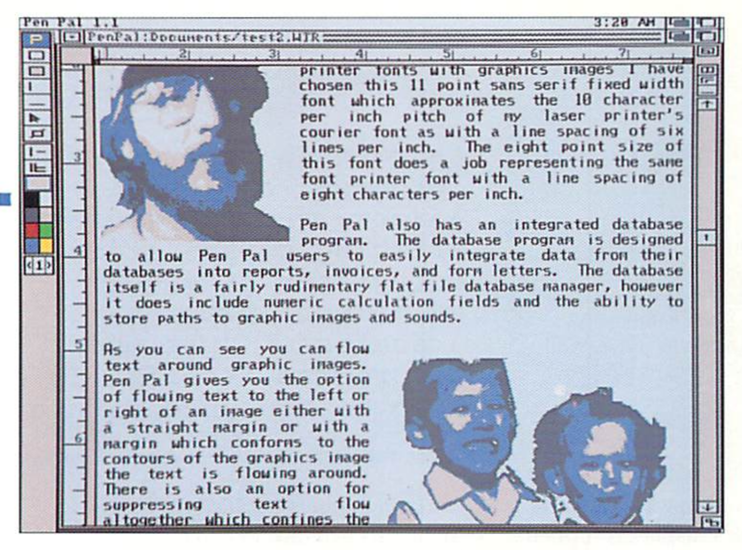
Pen Pal combines a word processor and a flat-file database manager with rudimentary desktop-publishing capabilities. Like most integrated packages, it is a mammoth program, tipping the scales at just under 400K.

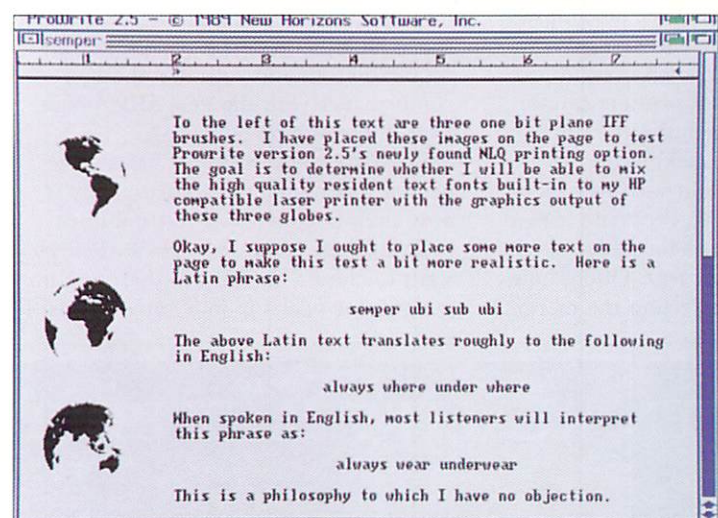
The word-processing portion includes all the features necessary for basic text editing: The obligatory set of range-manipulation functions, standard style enhancements (italics, boldface, and so on), automatic paragraph indentation, as well as justification, centering, date and time insertion, page numbering, and forced page breaks. You can change the color of text within your document, and the search-and-replace function allows case sensitivity. A full set of options are provided for left, right, centered, and decimal tabs. Graphics can be incorporated in both headers and footers. Pen Pal provides a 100,000-word dictionary and accommodates custom dictionaries as well. The spelling checker sports a word-lookup facility and can suggest alternatives for misspelled words. There is also an option for spell checking single paragraphs. Pen Pal can tally word, sentence, and paragraph counts, and calculate reading level, and the maximum, minimum, and average number of characters per word, words per sentence, and sentences per paragraph. Sophisticated features (such as macro support, index generation, automatic footnotes, automatic widow and orphan control, and outline-creation) that are becoming commonplace on word processors are absent from Pen Pal.

Among the desktop-publishing features is extensive support for IFF graphics. When importing images, you can size and scale, select background color (transparent or solid), and determine how text will be displaced (flowed) around the graphic. Once imported, you can move an image on the page, resize it, and crop it. The limited set of object-oriented drawing tools includes vertical and horizontal lines, and filled and non-filled boxes. Noticeably missing are diagonal lines, curves, and filled and non-filled circles. You can modify objects by changing their colors, fill patterns, and line widths, overlay objects and images, and arrange their depths. Sizing gadgets are provided, as is a facility for grouping objects. While Pen Pal provides a snap-to-grid option, the grid is unfortunately limited to ⅛-inch increments. The single most glaring limitation of Pen Pal's desktop-publishing program is its inability to handle multiple-column layouts. Also, there is no support for automatic hyphenation of words (important for improving the appearance of justified text) or inter-character spacing. For line spacing, you are limited to one, one-and-a-half, or two lines in six or eight line-per-inch increments.

### More Words, and Numbers, Too

Pen Pal's database management system is non-relational and non-programmable. Data is entered and displayed on a two-dimensional grid resembling a spreadsheet matrix. This format is handy for data such as phone numbers, addresses, and catalogs, but probably inappropriate for applications with numerous or very lengthy fields. Pen Pal supports a fairly complete set of field types: Amount, Date, Time, Yes/No, Phone, Calculation, Alphabetic, and Alphanumeric. IFF sounds and pictures are not supported, although the manual indicates that they will be in a future version. Only the calculation category is disappointing. Calculation fields can reference only amount fields and numeric constants, and can use just the four basic arithmetic operators. They cannot reference other calculation fields or refer to amount fields in other records (rows). The rest of the features are not so spartan. Pen Pal allows multi-level sorts and has a fairly com-




**Both Pen Pal (above) and ProWrite can flow text to the right or left of a graphic image, following a straight or curved margin. In both cases, I used the Topaz II screen font to match a 10-character-per-inch printer font.**

plete criteria-based search/selection facility. The database inherits the word processor's range-manipulation capabilities, which enable you to cut and paste between fields. Also included are columnar-report and mailing-label generation.

Pen Pal's greatest strength is its printing capabilities. The program can function as a screen-font-based word processor with print output controlled by Preferences. In another mode, Pen Pal allows you to mix resident printer fonts with IFF graphics. Amazingly you can mix the lines and box objects with printer fonts. Pen Pal's sophisticated mail- and report-merge facilities make it ideal for creating integrated custom invoices, inventory reports, form letters, and so on. Despite their flexibility and quality, however, Pen Pal's printing options are not without limits. Amiga screen fonts cannot be larger than 48 points. Also, there is no provision for using more than one printer font within a document, and regardless of how many sizes are built in to your printer, you must use a 10-character-per-inch width font for printing. Other sizes produce unpredictable results.

Pen Pal's interface is in keeping with the program's eclectic nature. You can control all program functions via mouse, and many via key combinations. In addition to pull-down menus, there are legions of gadgets occupying both sides of the screen, plus horizontal and vertical rulers and axes. These tools take up lots of room, especially on non-interlaced screens, so thankfully, you can hide the gadgets or enlarge the document window. To save you from having to memorize each gadget's purpose, a message box at the bottom of your mouse pointer displays the names of gadgets as the pointer passes over them.

Another example of superb insight is Pen Pal's font-selection menus. In addition to the typical listing of fonts by name with sub menus for point sizes, another menu lists point sizes with font names on sub menus. The attractive and functional file requester displays either Pen Pal files only or all files in a directory, along with size and date information for each. The requester also provides device gadgets, sorts files automatically, and allows you to jump to any section of a directory simply by touching the first letter of an entry. Preset color palettes are provided, but you can define your own as well. Pen Pal's 200-page spiral-bound manual includes clear overviews of each section, numerous examples and illustrations, a complete index, and a table of contents at the beginning of each section as well as at the front of the book.

The developer is aggressively working to enhance this product. During the process of this review, Pen Pal was upgraded four times (the latest version I received was version 1.1) to fix problems and add features. If you buy Pen Pal, be sure to send in the registration card.

## ProWrite 2.5

Version 2.5, the latest incarnation of New Horizon's popular screen-font-based word processor, is very much like Pen Pal except that it lacks a database facility. (For a review of the original ProWrite release, see p. 70 in the Sept./Oct. '87 issue.)

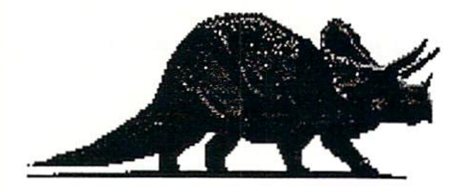
ProWrite's enhancements fall into three categories: interface considerations, word-processing features, and printing capabilities. ►




ProWrite 2.5's on-line spelling checker sometimes gets bogged down, then suddenly places a sentence or so on the screen in a clump. Document statistics tend to produce inaccurate results. On a scale of one to ten, I'd give the program a nine.

*—Tom Przewoznik*
*Melbourne, FL*

```
:egrates a basic word
 program, a flat file
ınager, and rudimentary
ɔlishing capabilities.
ıntegrated packages,
 a mammoth program,
ɜ scales at just under
ıe program itself.  In order to run Pen Pal your
ɜ to be equipped with at least one megabyte of
```



A Pen Pal print combines Hewlett Packard LaserJet 2 near-letter-quality fonts with graphics.

As with most screen-font-based word processors, ProWrite's display is topped by a ruler denoting margins, tab stops, and indentation. While earlier ProWrite versions ignored the ¼-inch margins on each side of a page that printers cannot access, the 2.5 ruler includes the unprintable left margin, making the program more consistent with its competitors. Unlike Pen Pal, ProWrite uses a minimum of screen area for gadgets, leaving lots of space for text. Often, however, I had difficulty selecting the margin and tab gadgets because they are so small. To expand text space, you can hide the ruler. The horizontal and vertical scroll bars now have arrow gadgets on the bottom and right-hand edges in conformance with the new ARP/AmigaDOS 1.4 standard.

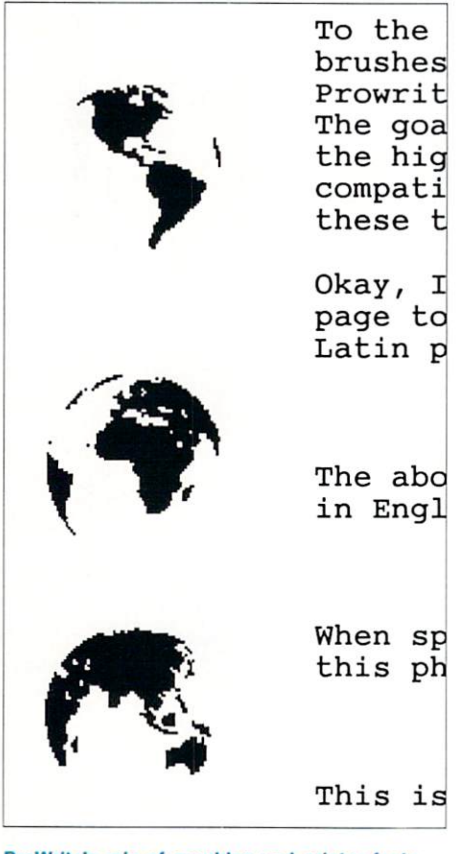
ProWrite's file requester has always been a sore spot, and unfortunately is only slightly improved. You still must cycle through mounted drives when you want to choose another, as there are no gadgets for selecting individual drives. It no longer forces you to wait while it reads an entire directory, however, before allowing you to select another device. In order to load standard ASCII files, you must hold down the ALT key while selecting Load from the menu. This awkward combination should be replaced by an ASCII button, like the one on Pen Pal's file requester.

As with Pen Pal, ProWrite provides the basic word-processing features, but lacks many extras that advanced users look for. Version 2.5 does, however, add a ►


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number of useful options, including the automatic insertion of times and dates (with several formatting options), centered tab stops, and a number of document statistics (number of words, average word length, and a readability quotient). More important are ProWrite's beefed up spell-checking abilities. The dictionary now includes 100,000 words, spell checking is faster, and a real-time checking option (which checks for spelling as you type) has been added. Also included is a facility for adding or stripping linefeeds when loading or saving ASCII text—an option particularly useful for telecommunicators.

The most important addition is ProWrite's ability to combine IFF images with resident printer fonts. Interestingly, ProWrite's implementation of this capacity suffers from the same limitations found in Pen Pal's. Without support for multi-column output, pitches other than 10 characters per inch, and other typographical niceties, the application of this feature is compromised.




ProWrite's mix of graphics and printer fonts.

### WHICH FRONTIER?

Both Pen Pal and ProWrite 2.5 are pioneering efforts as they introduce IFF-image and printer-font integration to the Amiga. Neither program fully realizes the potential of this concept, but I can recommend each program to a different niche in the market.

Pen Pal has lots of appeal for those with moderate productivity needs. Its database is well-suited to mailing-list management and other such applications. Its desktop-publishing features and graphics prowess are more robust than ProWrite's, and when combined with its mail-merge facility, are nearly ideal for creating custom forms. Pen Pal's interface is innovative and easy to use.

ProWrite 2.5 is also easy to use and is essentially equal to Pen Pal in terms of word-processing muscle, while being less

*Continued on p. 62*

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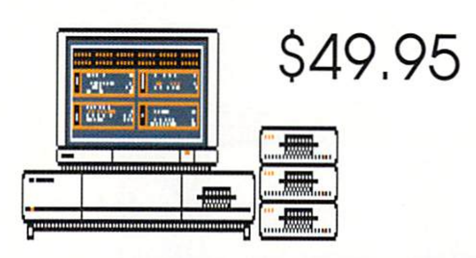
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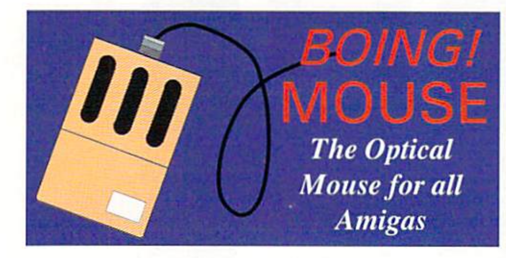
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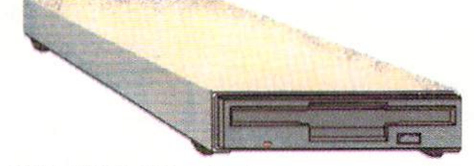
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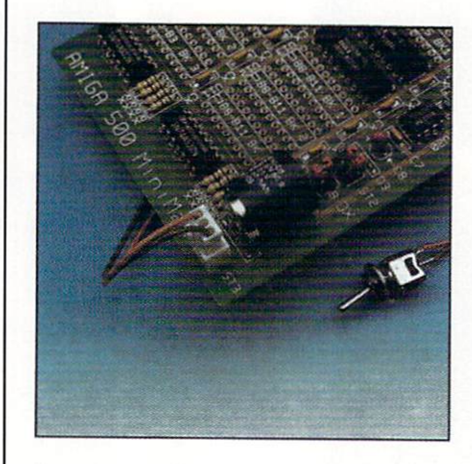
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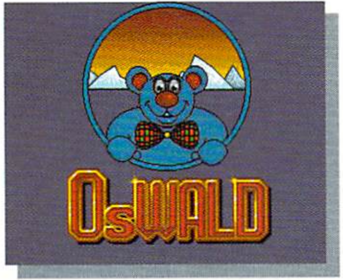





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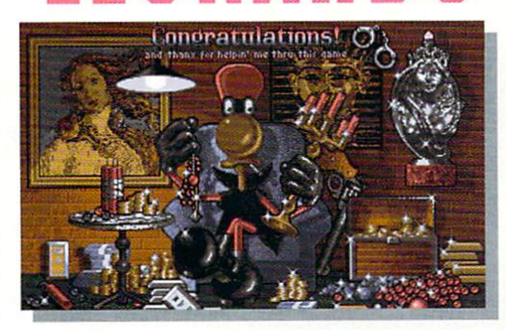



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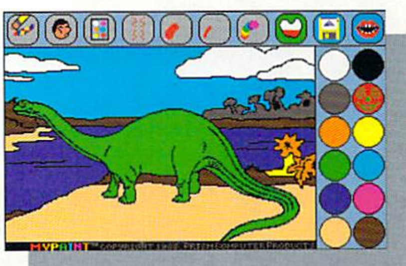
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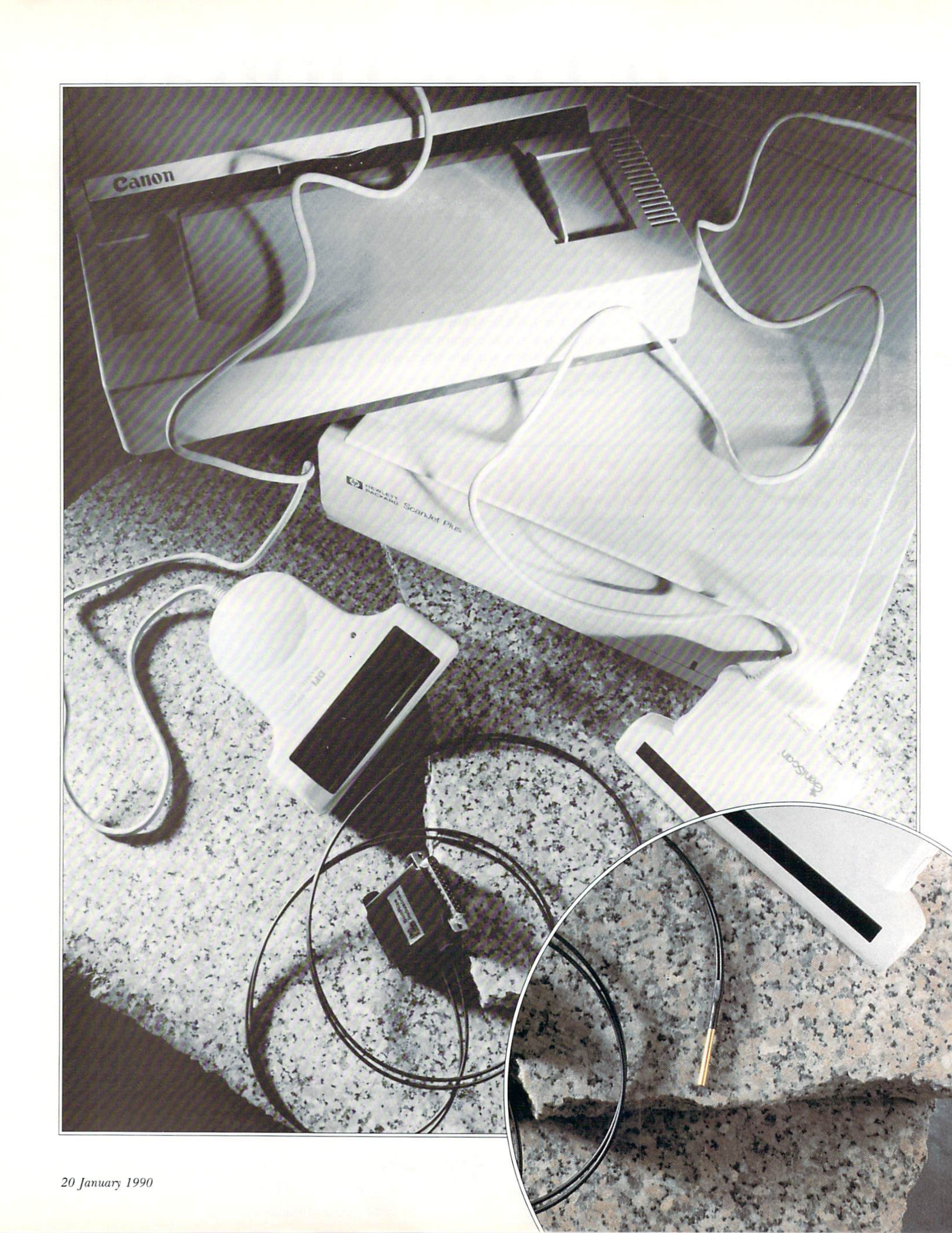
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# Scanning the Competition



OR DESKTOP PUBLISHING, the output has to be perfect. You must carefully combine the proper design, fonts, and imported graphics, then output the results to your printer. Therein lies the problem. While images with resolutions from 320×200 to 640×400 dots look excellent on screen, when printed at 300 dots per inch (dpi) on a laser printer, even the biggest of the lot will be less than two square inches. Desktop-publishing programs get around this by expanding the bitmap image. The printed image will be larger, but it will be very low resolution compared to what the printer can do.

To take full advantage of the printer, you need larger pictures. For example, to output a 300 dpi 4×3 picture, you will need a bitmap image made up of 1200×900 dots; an 8×10 printed image requires a resolution of 2400×3000 dots. The answer is an optical scanner.

*When you need a hi-res handle on large graphics, a scanner is just the ticket. Let's eyeball five black-and-white models and compare results.*

What if you need to import an image from a photograph, drawing, or official document into your desktop-publishing or database program? You could capture them with a video camera and a digitizer, such as Digi-View (NewTek, $199.95) or Frame-Grabber (Progressive Peripherals & Software, $699.95). Because of their output's screen-based resolution, you still will be faced with the same small, relatively lo-res printed output. Again, a scanner is the answer.

Optical scanners are very similar to office copy machines, with one key difference. Instead of re-creating the source image on paper, they create a very high-resolution computer-graphic image. You can then edit the image with a paint program and paste it into your document or store it directly in an IFF-compatible database.

If you need color images, your options are limited to ASDG's superb software and interface for Sharp color scanners (reviewed in May '89, p. 12). If black-and-white or gray-scale images will suffice, however, you can choose among tabletop, hand-held, and printer-based models. We put representatives from Gold Disk, Inset Systems, C Ltd., Datel, and SunRize Industries to the test.

### Desktop Delights

A leader in desktop-publishing software for the Amiga, Gold Disk offers the **ProScan IX-12** package ($1095), which includes software, an interface, and the Canon IX-12 black-and-white scanner. The interface connects to any Amiga's parallel port but has a pass-through that allows you to hook up a printer.►

**By Louis R. Wallace**

PHOTOGRAPHED BY LARRY DUNN

The Canon IX-12 scanner is about the size of a small dot-matrix printer. It accepts images up to 11 × 17 inches, of which it scans an area of 8.5 × 16 inches.

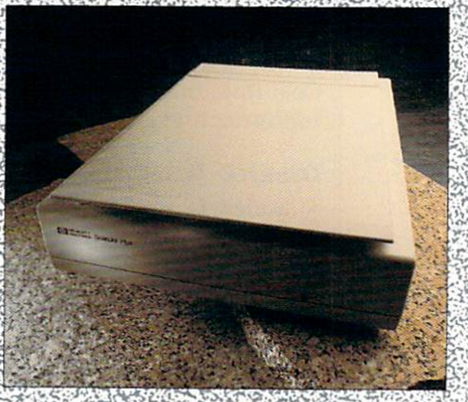
The ProScan software is very easy to use. It operates by default in 640 × 400 mode, but you can change to 640 × 200, 320 × 400, or 320 × 200. Scanning resolutions (75, 150, 200, and 300 dpi) are menu-selectable. The two main scanning modes are Black-and-White and Halftone. Black-and-White mode is designed for high contrast images, such as line art and text. Halftone mode is for scanning photographs and shaded images. (Halftones are photographs that have been re-created using varying densities of black dots, to reproduce the picture's shading.)

To scan, you simply put the paper into the slot on top. The scanner automatically pulls the paper in a couple of inches, then waits for you to select Scan from the program's menu before continuing. The scanning process is very fast; an 8.5 × 11 sheet takes less than a minute at 300 dpi, and mere seconds for lower resolutions. When the scan is complete, the image appears on the screen. You can scroll around with the cursor keys to examine it.

For a closer look at a section of your document or photo, use the Zone option: Draw a box around the area of interest, then feed the original document into the scanner again. If your document is not inserted exactly as it was the first time, the re-scanned zone will not be as you expected. Make the original zone a little larger than you need to be sure you get the area you want. You can edit out the extra with a paint program.



*The Canon IX-12 accompanies Gold Disk's ProScan software.*



*Sold separately, Hewlett Packard's ScanJet Plus and Inset Systems' Scannery make a powerful combination.*

Two more software options let you customize the image. Thicken makes the scanned images thicker, while the Darkness control allows you to lighten or darken the image.

I found ProScan IX-12 easy to use and its output of very good quality, especially for line art. When I scanned using 68020 mode on my A2500, however, the results were distorted, with some scanlines seemingly out of sync. The problem did not occur when in 68000 mode.

**Scannery** (Inset Systems, $250) is a software-and-hardware package that allows you to connect an A500 or A2000 to a Hewlett-Packard ScanJet Plus ($1595). Without doubt, this is the premier black-and-white scanner system for the Amiga.

A desktop model, the ScanJet looks very similar to a desktop copier. To scan a document, you lift the lid, place the original face down on top of the glass, and close the lid. The Scannery software can scan a full-page document at a variety of resolutions. The maximum is an incredible 600 dpi, which you will need a linotype printer to output. When you activate the program, it opens a 640 × 400 black-and-white display, half of which is a preview area. Various gadgets that control the scanning process fill the rest.

Capturing an image is a three-step process. First, click on the Preview button to see a quick low-resolution scan of the image in the preview area. You must then define the area you want to scan by drawing a box around it called the Clip Window. Because the original image is exactly where it was for the preview scan, this Clip Window is quite precise. When the image is scanned again you will get the area you selected. Start the real scanning by clicking the Final Scan button. This brings up a file requester prompting you for the file's name. You must name the scan now, because Scannery does not show you the final scan from within the program; instead, it writes the image directly to disk as an IFF file.

To see the results, you must load a paint program such as Paint from Deluxe PhotoLab (Electronic Arts, $149.95) to display the picture. If you are low on RAM, you will probably have to exit Scannery to see your image—a very irritating necessity. The lack of a view mode for the finished scan is the only shortcoming of an otherwise excellent piece of software.

Scannery has a large number of options available to help you get the best possible results from your source document. The Brightness control is similar to its equivalent on a copy machine. If your original is very dark or very light, you can change this setting to increase or decrease the final contrast. In addition to Black-and-White mode for line art and text, Scannery offers Gray Scan mode, which provides a scanned picture made of 16 levels of gray (using four bitplanes for the image) and is very useful for scanning photographs. Dithered mode creates halftone-

style images in four different patterns, three more than ProScan provides. Besides standard dotted patterns in different sizes, Scannery has a vertical lined pattern that can be used for striking results.

You have plenty of choices for saving the scanned image, as well. Besides the default IFF format, Scannery supports PCL (Printer Control Language), EPS (Encapsulated PostScript), and FAX file format. PCL is a special format from Hewlett-Packard that, once saved, can be printed directly by any HP-compatible printer. Simply copy the file to the printer using AmigaDOS or a supplied utility. EPS files are standard PostScript files that you can print on any PostScript printer. While no standard format exists, the included FAX file format will work with many FAX machines. (So far there are no FAX boards for the Amiga.)

Scannery was a pleasure to work with. It is fast and reliable with a large number of options. Again, 68020 mode caused problems. The program would freeze until I rebooted in 68000 mode.

### Hand-Held Help

If you do not need a full-page scanner (or your budget will not allow one), try a hand-held one. These small scanners are less expensive, in part because they do not have moving pieces. Instead, you must move them across the source document. The trade-off is that they are smaller and cannot scan as large an original as the tabletop machines can. Both hand-held models I looked at scanned a maximum width of about four inches.

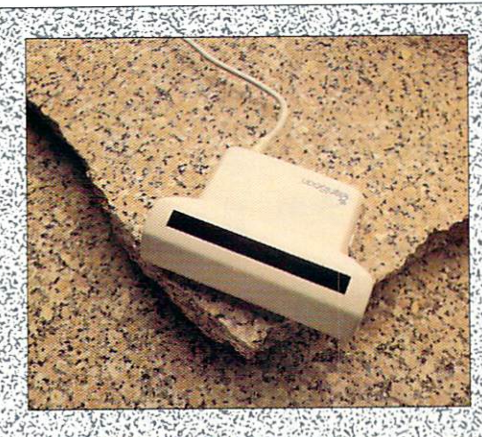
Compatible with all Amigas, **Han-D-Scan** (C Ltd., $399.95) is surprisingly full-featured. Han-D-Scan scans at 100, 200, 300, and 400 dpi. To select the resolution, position a small switch on the scanner. A second switch specifies which of Han-D-Scan's four dithering patterns is used. Letter mode is the standard black-and-white line-art mode. Photo 1, Photo 2, and Photo 3 are various degrees of halftone dithering. Which you should select depends on the destination of your final output. For example, if you intend to print on a low-resolution dot-matrix, use Photo 3's coarse setting. For a laser printer, Photo 1 offers a finer halftone screen. To change the contrast of the scanned results, you would use the Light/Dark Adjuster switch. The Han-D-Scan software is even more interesting. Basically, it is a version of Diamond, a full-featured paint program from Impulse.

The scanning process is very simple. From Diamond's Project menu, select Scan to pause the program long enough for you to activate the scanner and start scanning. With your original laying flat, position the scanner at the top of the area you want to scan. Press the Activate Scan button on the scanner and slowly move the pickup down the document. The data is sent to the paint program when you release the button or run out of memory, whichever comes first.

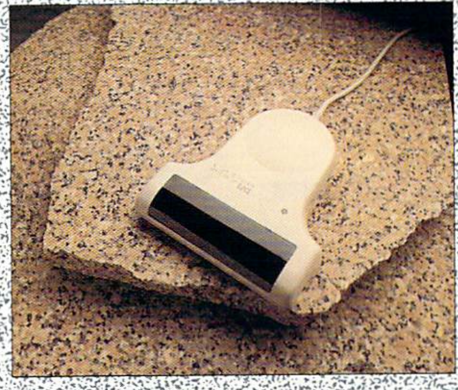
While the widest area you can scan is four inches, do not assume that this generates a small image. For example, scanning an area of 4 × 8 inches at 300 dpi creates a final picture of 1200 × 2400 bits, so large an image that many Amiga paint programs cannot load it. Han-D-Scan, however, supports virtual pages, which can be as large as your RAM allows. Diamond easily handles virtual pages, so you can use it to manipulate and edit your scanned images.

The Han-D-Scan manual is quite extensive and includes several tutorials on scanning. The package also contains a full manual for Diamond. Although Han-D-Scan does not support color, Diamond works in all Amiga graphic modes, including Hold-and-Modify and Extra_Halfbrite.

While very similar to C Ltd.'s system, **GeniScan** (Datel, $299.95) has fewer options. It too has switches ►



*Datel's GeniScan lets you do a one- or two-page scan.*



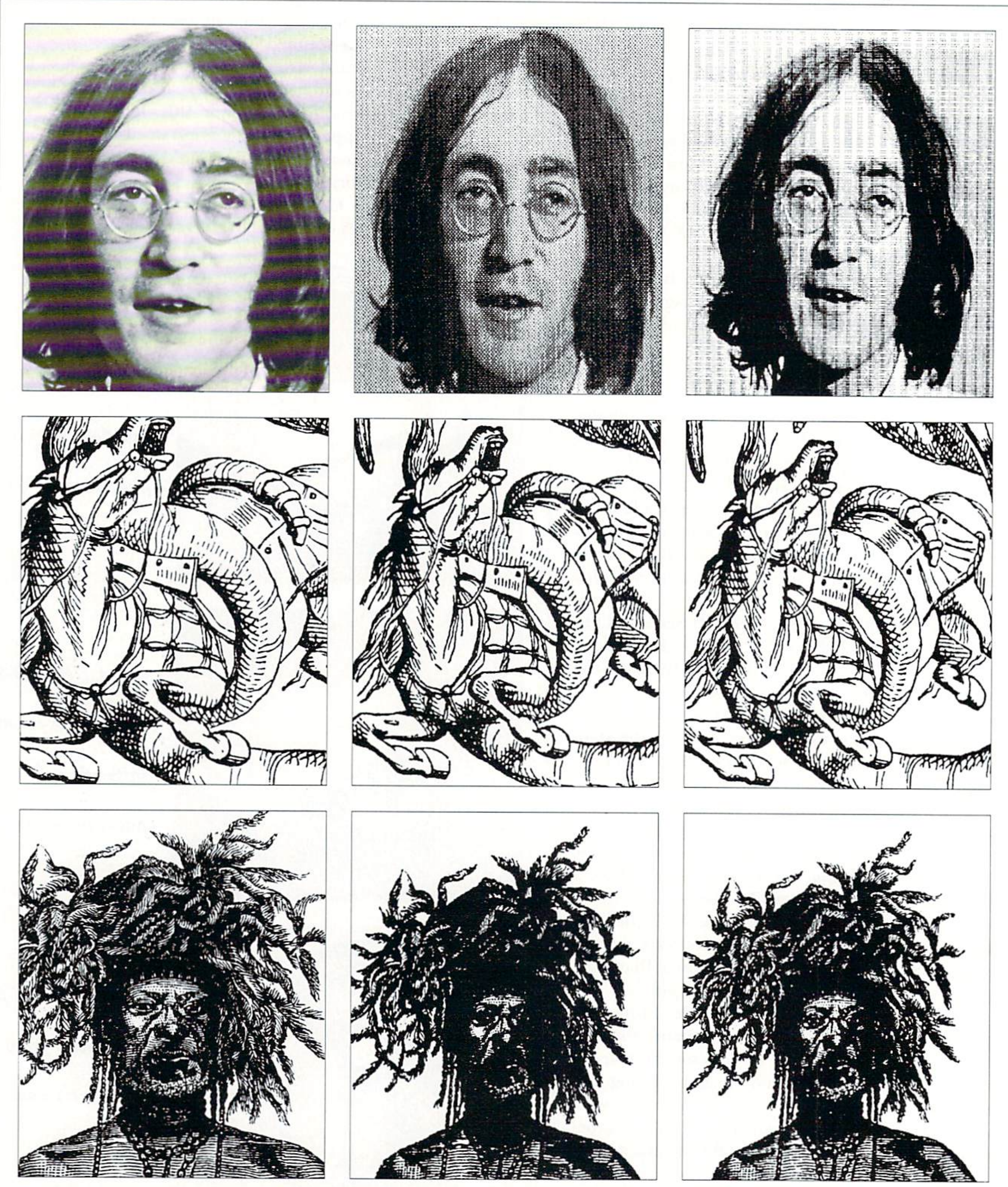
*C Ltd.'s Han-D-Scan comes with scanning software and a complete paint program.*



*You supply the printer; IMG Scan from SunRize Industries does the work.*

on the scanner for 100, 200, 300, and 400 dpi, but the current software allows only 100 and 200 dpi. The next version of the software promises to support resolutions up to 400 dpi. Datel's hand scanner has four dithering modes selected from the scanner itself. Letter mode is for simple line art and the three Photo settings give various degrees of halftoning. The Brightness control and Activate Scan button are also on the scanner.

The software supports several options. You can



*Comparative output from the two best scanners: Original artwork (left) was scanned with ProScan (center) and Scannery (right) and printed at 300 dpi on an HP-compatible laser printer.*

select a one- or two-page scan. Pages are the height of the screen, which is the PAL standard 256 dots. For width, you can scan in a screen-oriented mode (640 dots wide) or a buffer-oriented mode (800 dots wide). Several cut, copy, and paste features let you manipulate the image in the buffer as well as on screen. Special effects (such as invert, reverse, and positive/negative switching) are also available. The horizontal and vertical compression options shrink the image by half.

Unfortunately, the Datel scanning software suffers from some serious limitations. You can scan a 4 × 2½-inch original at 200 dpi using the Buffer and Two-Page Scan options to create an 800 × 512-pixel image. When you save this information, however, you have only two options. The standard IFF save stores the screen image in PAL 640 × 256 resolution, while a Raw save stores the data in a non-IFF format. You end up with either a screen-resolution image or one that is not compatible with IFF programs.

All in all, I was disappointed with Datel's GeniScan. The hardware is fine, but the software lacks many important features. Wait for the upgraded software. Until then you are limited to fairly small scanned images.

### PRINTER POWER

**IMG Scan** (SunRize Industries, $149.95) takes a totally different approach. The package consists of software, a parallel interface, and a thin image cable that contains a fiber-optic pickup. The scanner is unique because it uses your printer as the vehicle to move the minute scanner head back and forth.

After removing the ribbon, install the scanning cable to the print head of your dot-matrix printer using two small metal clips. The exact procedure depends on the printer model; on some printers this is very easy, on others it is very difficult. I used a Star NX-10 and found it to be quite troublesome. To help, SunRize includes metallic tape with which you can hold the cable in place. The image cable's position is critical. It must be within $\frac{1}{16}$ of an inch from the paper, but not touching it. If it is not correct, the scanner produces blurry images.

You insert the original document into the printer as you would feed in a single sheet of paper. It moves automatically through the printer in increments your printer can resolve. The vertical resolution of your printer determines the final resolution of your image, which can be as low as 144 dpi or as high as 360 dpi for 24-pin printers. Most dot-matrix printers are around 216 dpi.

The software comes with a configuration file set for the Star NX-1000 printer. If you own another model, be prepared to create a new file—a process that requires you to know a fair amount about the control codes that make your printer work. You can find the information in your printer's manual.

The scans are created in black and white or in 16 shades of gray. It is not a fast process, taking ten or more minutes per scan. Lower resolutions scan faster. The finished image is in the current screen resolution (320 × 200, 320 × 400, 640 × 200, or 640 × 400). You can save the screen as an IFF image or as a raw data file, which can be loaded only by the IMG software. Black-and-white images are still saved with four bitplanes even though they appear in monochrome.

You do have some control over which area of the original document you scan. IMG's software allows you to specify the height, left margin, and width of the scanned area. By carefully tuning the settings to your printer you can get different results from the same original document.

Basically, IMG Scan left me cold. While it is an inexpensive and innovative way to produce scanned images, you could do a lot better with a digitizer. It too gives you only screen-size images, but ones of far better quality.

### OUTPUT OPINIONS

While much of your decision should be based on how much scanner you can afford, do not compromise quality. I recommend the Scannery/ScanJet Plus combination as the best and most flexible system. The budget conscious should check out Han-D-Scan. When coupled with Diamond, it makes an attractive package. ■

## Manufacturers' Addresses

**ASDG**
925 Stewart St.
Madison, WI
608/273-6585

**C Ltd.**
723 E. Skinner
Wichita, KS 67211
316/267-3807

**Datel Computers**
3430 E. Tropicana Ave.
Unit 67
Las Vegas, NV 89121
702/454-7700

**Electronic Arts**
1820 Gateway Dr.
San Mateo, CA 94404
415/571-7171

**Gold Disk**
P.O. Box 789, Streetsville
Mississauga, Ontario
Canada L5M 2C2
416/828-0913
800/387-8192

**Hewlett-Packard**
19310 Pruneridge Ave.
Cupertino, CA 95014
800/367-4772

**Inset Systems Inc.**
71 Commerce Dr.
Brookfield, CT 06804
203/775-5866

**NewTek**
115 West Crane St.
Topeka, KS 66603
913/354-1146

**Progressive Peripherals & Software**
464 Kalamath St.
Denver, CO 80204
303/825-4144

**SunRize Industries**
3801 Old College Rd.
Bryan, TX 77801
409/846-1311

# Electronic Collage




**Computerized image processing is giving a new twist to the old technique of composite imaging—with results that will turn the heads of a lot of Amiga artists and animators.**



BY GENE BRAWN

WHAT DO ROGER Rabbit, Tron, Star Wars, and your local television news program have in common? They all rely heavily on variations of a technique that photographers have known about since the 19th century: composite imaging. Briefly put, this is the art of skillfully combining many images into one in order to create a new "reality." The concept in its simplest form is nothing other than that of an old-fashioned paper collage. The advent of computerized image processing is breathing new life into this venerable technique, with unprecedented results—and legal ramifications.

Armed with nothing but your trusty Amiga and some off-the-shelf software, you will discover you possess all the tools necessary to create images no less fantastic than these multimillion-dollar examples. In this tutorial I will show you how to transport the fantasies that inspire such images from your imagination to your Amiga screen. Whether you are a graphic artist or an animator; whether you work with flat graphics, 3-D images, or animation sequences; you will find these tips to be a valuable addition to your Amiga arsenal.

Producing a composite scene, while not simple, is surprisingly straightforward. In brief, to create our "electronic collage," we will (1) choose the source images; (2) transform them into brushes and match their resolutions; (3) create a universal palette that will encompass all the separate images that will make up the whole; and (4) put the pieces together and touch up the completed image.

### PRELIMINARY CONSIDERATIONS

Before we move to step one, let's look at some general principles you should keep in mind in approaching the whole project, and also consider what tools you will need to complete the project.

Although you can create a simple composite image in a single evening, do not expect to produce your masterpiece so quickly. A successful composite image is the result of careful planning, attention to detail, and many hours of experimentation and hard work. ►



ILLUSTRATED BY JOHN PIRMAN

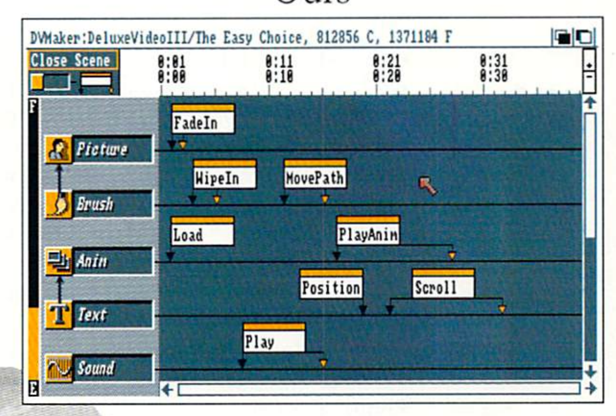
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```
Ed 1.14
    load 2,":pictures/xyzparts"
    load 1,":pictures/xyzpic"
    loadfont 1,9,"topaz.font"
    array 300,1
    execute a,"assign fonts: temp:"
1     abort 0
    display 3
    margins -1,-1
    center 1:clear
    setfont 1:move 0,120:text "titleline"
    fade 1,3,6:pause 29:fade 0,3,5
    clear
    display 1
    abort 1
    Z=1
    wipe 1,20,20,40,40,-1,-1,400,1
    gosub 200
    pen 1,14
    t=433:u=434
20    move t,285:draw u,285:move u,286:draw t,286
    t=t-1:u=u+1
    if t#328:goto 20:endif
```

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ELECTRONIC ARTS®

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The positive side to all the effort is the enormous satisfaction of seeing your ideas come to life completely under your control.

Your paint program will be the software workhorse of any compositing session. To date, I have not found a single paint program that satisfies all my needs. Fortunately, the major paint packages all conform to the IFF (Interchange File Format) standard, so their output can be freely intermixed. This flexible file system allows me to use the software best suited to the problem.

Normally, I begin a session with DeluxePaint III (Electronic Arts, $149.95) or Deluxe PhotoLab (Electronic Arts, $149.95), depending on the color format of the images I am manipulating. Photon Paint 2.0 (MicroIllusions, $149.95) frequently comes in handy, especially when I want to use texture, perspective, or shading. I then use Digi-Paint 3 (NewTek, $99.95) to assemble the pieces and touch up the final image. Another, essential piece of software you will need is an image-processing program. Although each program in this category has its strengths, none can do it all. Believe it or not, I use Digi-View's (NewTek, $199.95) software component (now included with Digi-Paint 3 as Transfer 24) for most of my image-processing work. Other image processors I use regularly include: PIXmate (Progressive Peripherals, $49.95), Butcher (Eagle Tree, $37), and Deluxe PhotoLab's Colors module.

If your budget is tight, or you are seeking an all-in-one solution for your graphic toolchest, Deluxe PhotoLab—while not the last word—is a good overall choice. The only Amiga paint program that works in all graphic modes, PhotoLab also includes useful image-processing and printing software.

**Step 1.**

### Picking the Pictures

Your initial task is, of course, to pick the images you want to combine. This task is much easier if you have a theme for your creation. For example, you might put yourself in a scene from your favorite movie, or create the ultimate snapshot from your vacation on Mars, or give yourself the body you always wanted . . . without ever lifting a weight. On the practical side, the next time your spouse or roommate friend decides to rearrange the furniture, why not suggest that it might be easier to try out their ideas on your Amiga first?

Sources of pictures abound. If this is a personal project, your choices are virtually unlimited. Many high-quality clip-art packages on disk are now available for the Amiga. The art sections of the national networks such as Plink or CompuServe also offer a good selection of images. If you have a digitizing setup, magazines offer a plethora of professional artwork.

If you plan to market your creations, be mindful of copyright laws. Digital image manipulation has raised some sticky questions regarding the ownership of electronic works of art. If you use even a small part of a picture from a magazine or television show, you may be in violation of a copyright. Until this issue is resolved by the courts, you should consult an attorney familiar with this area before you include copyrighted art in your images.

Although the Amiga offers 4096 colors in the Hold-And-Modify (HAM) mode, do not assume that you have total freedom when combining colors. There are, in fact, severe limitations to what your Amiga and your favorite paint program can display on the screen. Trying to combine Uncle Joe's Hawaiian shirt and Aunt Mildred's flower garden will probably overload the Amiga's color capabilities.

To insure the best results, follow these guidelines: Pick a simple and consistent color scheme for your picture. For example, if you want to include a group of people in the image, limit the background to just ►

## "Turnerizing" Your Images

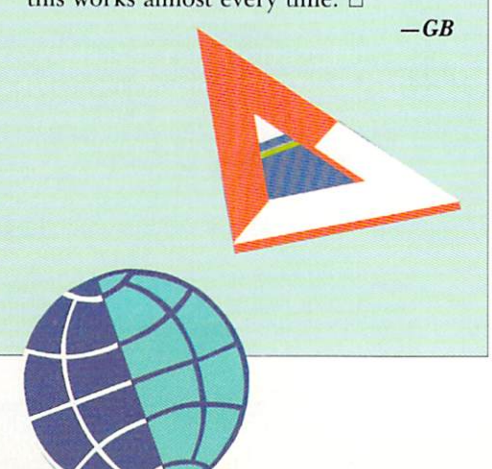
ONE OF MY favorite techniques is colorizing a picture by hand before I add it to the collage. It is one of those simple, but extremely useful, techniques that you will come to find quite handy.

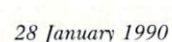
Many paint programs have tools allowing you to add color to a black-and-white digitized image. Digi-Paint 3, for instance, has its "colorize" mode, while Photon Paint 2.0 and Deluxe PhotoLab both contain "add" modes for the same purpose. Granted, it is a useful technique, but why not go a little further?

If you are having trouble making one of the pieces of your electronic collage match the master palette, try this: Load the brush into Butcher or Deluxe PhotoLab's Colors or Paint modules. Select the black-and-white modes, then redisplay and save the now monochrome brush.

Load this "decolorized" brush into your HAM paint program, along with the master picture (and its palette). Clear the screen and stamp the brush down. Then, simply select the "add" or "colorizing" tool and recolor the brush with the master palette instead of the brush's native palette. You will discover this works almost every time. □

*—GB*








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a few hues. Let the subjects' flesh tones dominate the composition. Better yet, eliminate the background entirely and use your 2-D paint package or 3-D rendering program to create a custom backdrop.

**Step 2.**

### Resolving Your Differences... And Brushing up the Results

Once you have chosen and assembled all the pieces for your composite masterpiece, the next step is to convert them to the same screen resolution (we will match the color resolutions later.) For most of my work, I use the software included with Digi-View. I prefer its speed and the superior results I get when I use its dithering and sharpness controls.

As we will be working in HAM, the dimensions of the completed image can be either 320×200 or 320×400, depending on your choice of formats. If you use Digi-View, select one of these resolutions when you start the program. The conversion is handled automatically by the software when you load the picture (be sure to preserve the original number of colors when you resave the newly converted image.) The process is similar for PIXmate, Butcher, and Deluxe PhotoLab's Colors, except that in these packages, you select the conversion process from the menus after you load the picture.

When you have all the pictures in the same resolution, use your paint program to cut them into brushes. This is the electronic equivalent of cutting out pieces of photographs in a magazine to create a paper collage. If you plan to use one of your pictures as a background, set it aside for now. Convert the remaining pieces into brushes by carefully outlining the area as a brush and cutting it away from the background. Save each brush as a new file.

**Step 3.**

### Creating the Master Palette

Now for the most important, time-consuming, and difficult part of the entire process: creating your master palette. Because your final (HAM) picture can contain only 16 base colors, it is unlikely that you will be able to include every color from every brush in this universal palette. Your goal, then, is to create the optimum set of colors the paint program can use to synthesize any others it needs to display your electronic collage.



**"The Hunters" (above) combines elements from six sources with different palettes into a single 320×400 HAM image.**

Load your background picture into the image processor of your choice (if you do not have a background image, use the largest or most important brush.) Reduce the number of colors to the absolute minimum necessary to display it faithfully. The idea here is to free up some of the positions in the base palette. Inevitably, there will be at least one brush that will not display properly; a few open slots in the palette will give you the flexibility to add the colors you need to make it work.

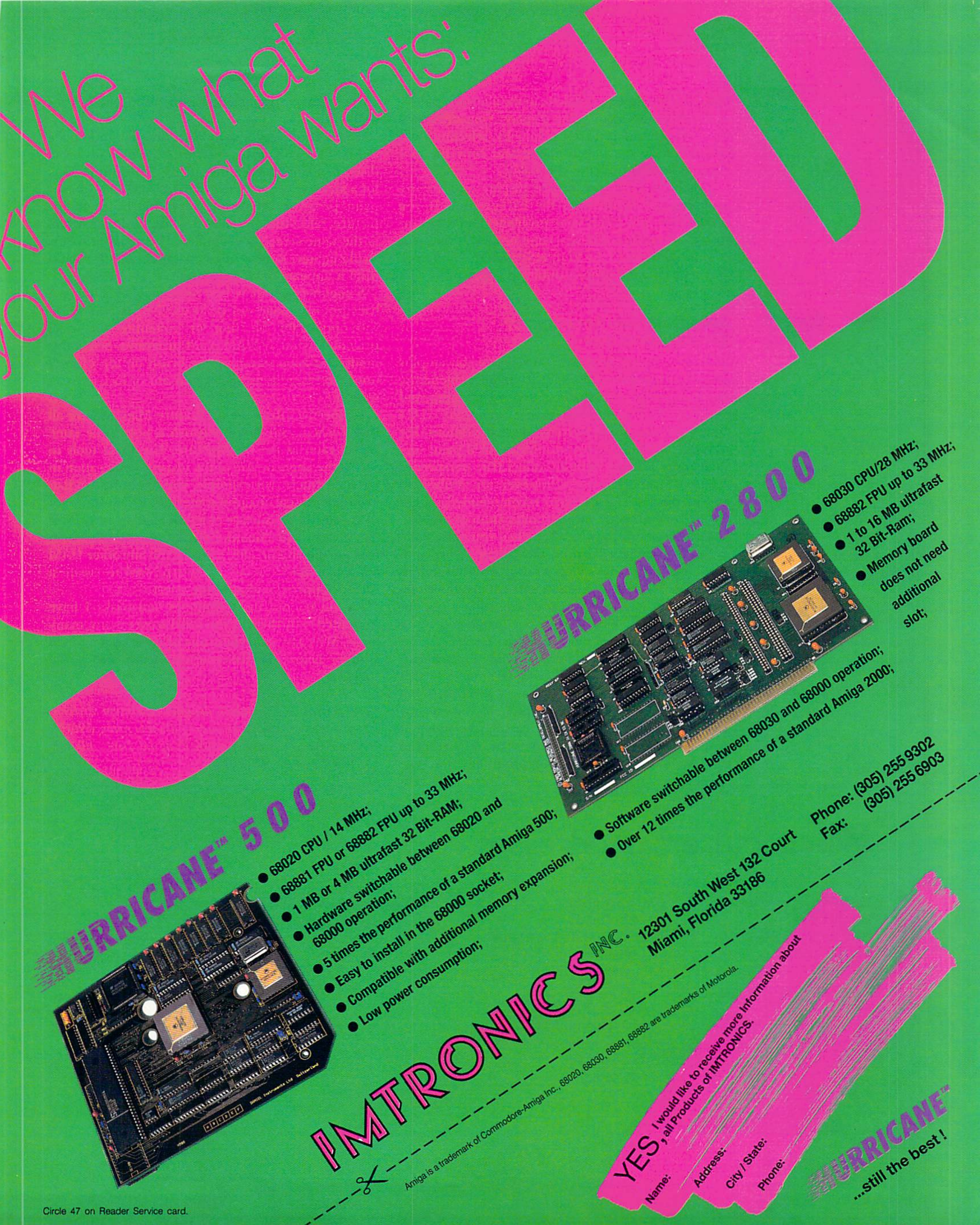
All the image processors I use have a feature that allows me to specify the number of colors to use in a palette ("reduce colors," or something similar.) I use this tool to successively reduce the number of colors—one at a time, starting with the original set of colors—each time I try a lower setting. I repeat this process until the picture's quality degrades to an unacceptable level. This new, optimized picture and its palette then form the basis for my new creation.

Process brushes in the same way, although for a different reason. Remember that each piece originated from a larger picture that probably contained colors not included in the brush. There is no need to carry extra baggage.

You will be manipulating the palette quite a bit for the next step. Although any HAM paint program will work, Deluxe PhotoLab's Paint module is ideal for this process. The program's palette tool has a secondary color area where you can create and store hues while you load a new set from another image into the main palette. First, load the background picture into the paint program. Then, load a brush and stamp it down in place onto this picture. Do the colors in the brush look right? If they do, fine; you are done with that brush. If not, you will have to do some work.

Normally, the problem is simple color "fringing" around the brush. This is a result of the limitations of the HAM mode. The picture contained an abrupt transition between colors that the program could not bridge in one pixel. Before you try adding colors to the base palette to correct this, select the "smooth" option from your paint program's menu. Stamp the brush down again. The software can sometimes smooth out the ragged edges enough to minimize or eliminate the problem.

Less often, the brush's colors have changed so much that it is nearly unrecognizable. In this case, bite the bullet and add a color to the base palette (or, if there is no room left, modify an existing color.) First, compare the brush's natural appearance with its modified form on the background. Next, select "use brush palette" from the Project menu. Copy the necessary ►



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color(s) from the brush palette to the alternate palette area below the main color display. Finally, restore the background picture's colors by selecting "use picture" from the palette menu and copy the new color to an empty slot in this palette.

Switch back to the picture display and try restamping the brush onto the background. If you picked the right color, your problem should be corrected. If not, try a different color or modify the color of your choice with the RGB/HSV sliders, "undoing" and repeating the process until you are satisfied with the results.

**Step 4.**

## Assembling and Touching up Your Composition

In order to finish the piece, you will probably employ one or more of the following techniques: blending, resizing, perspective, shading, texture mapping, and blurring. As I mentioned earlier, not every HAM paint program can perform all these operations. For example, of all the programs in the HAM paint universe, only Photon Paint 2.0 offers true perspective rotation. Most of the tricks, however, are available in any of the packages I have recommended, either directly or indirectly with a combination of tools.

Always smooth your brushes when you place them in the final image. Turn on the "smooth" or "antialias" tool before you stamp it down, or if this softens the image too much, carefully smooth just the edges of the brush after you put it down, using a one- or two-pixel brush. Either way, your image will blend into its surroundings much more naturally.

I almost always add shadows to any three-dimensional objects, using the following technique: First, I darken all objects on the sides away from the light. Then, if necessary, I can cast their shadows on the ground using Photon Paint's Perspective mode. I simply rotate the brush until it appears parallel to the ground and then select the program's "darken" effect to cast a simulated shadow using the brush's shape.

A very effective way to indicate depth is to simulate the natural haze that obscures objects viewed at a distance through the atmosphere. To do this, look for a menu selection called "lighten" or "add" in your paint program. After you apply the brush to the picture, select this option and stamp the brush again, at the same screen coordinates. The image will be a shade lighter. Repeat this step, lightening the object until it appears to be as far away as you desire.

Sometimes depth is best suggested by forcing a background image out of focus. This is easy to do with options for "blurring" or "softening" the brush provided by many HAM paint programs. Select this mode and keep stamping the brush on top of itself until the image is as blurry and out of focus as you want it.

Perspective, Resize, and Texture Mapping are all useful when your original brush is not in the same aspect ratio as the final picture. Use these tools to match the angle or size of the brush to its location in the final image. For example, you might have a flat, two-dimensional image of some marble that you want to appear on the surface of a wall angling away from the viewer. Use Photon Paint 2.0 to rerender it in true perspective or, alternatively, use any other HAM paint package's "wrap" or "warp" tool to create a realistic approximation of the effect.

As you try out the techniques and tricks I have presented in this article, you will discover many, many more. Why not send the fruits of your labors to the address below. Maybe you can teach me a few tricks. ■

*Gene Brawn is a graphics designer, television director, digital animator, and a contributing editor to* AmigaWorld. *Write to him c/o* AmigaWorld, *Editorial Dept., 80 Elm St., Peterborough, NH 03458.*

# Manufacturers' Addresses

**Eagle Tree Software**
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**MicroIllusions**
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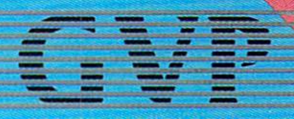
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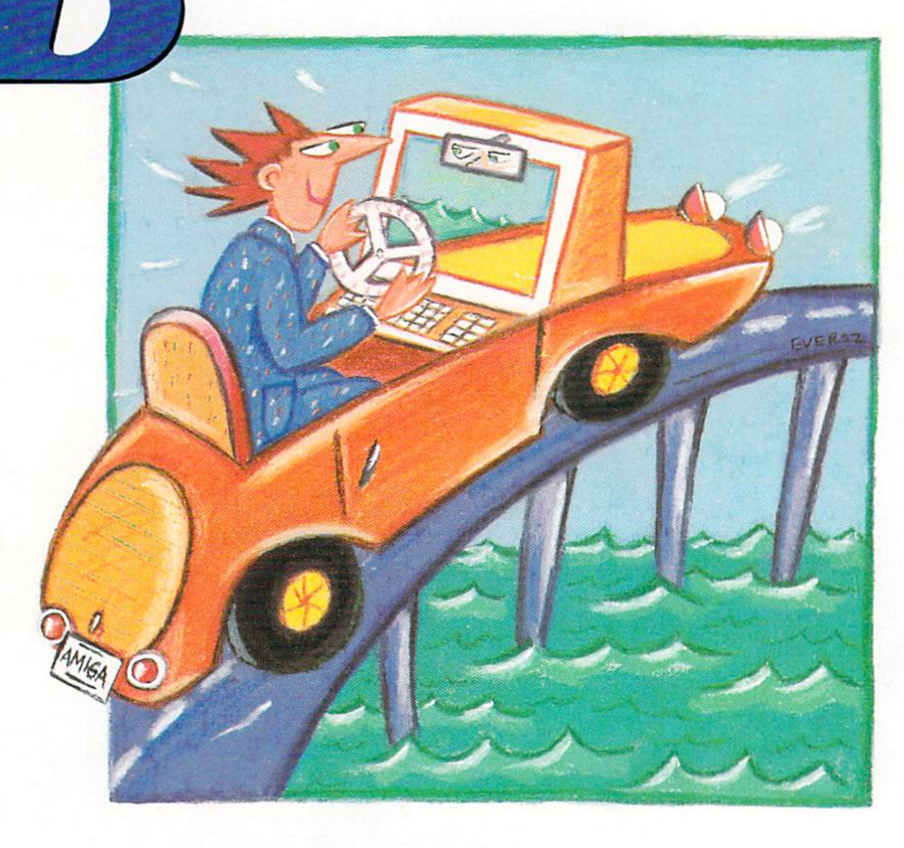
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# Bridging the Gap to Big Blue




With newer and faster IBMs running more powerful PC applications, it's time for the compatibility crowd to trade in the old Bridgeboard for a top-of-the-line A2286.

**By Timothy Trimble**

WHEN IT FIRST arrived, the A2088 was the perfect vehicle for IBM compatibility. Now, up against the faster processing power of IBM 80286 and 80386 computers that run from 8 MHz to 30 MHz, the PC/XT-compatible board seems like a skateboard trying to keep pace with a Corvette. Before you withdraw from the race entirely, however, take Commodore's new A2286 IBM PC/AT-compatible Bridgeboard for a test drive.

Running at 8 MHz, the A2286 is basically an IBM PC/AT computer on a card. It comes with the 80286 processor, a socket for an 80287 coprocessor, one megabyte of RAM, and a lithium battery for the real-time clock/calendar. A 1.2MB 5¼-inch high-density floppy disk accompanies the card, almost tripling the capacity of a PC/XT floppy drive. With the A2286 Bridgeboard installed, you can use the Amiga's three PC slots for enhancing the system with a VGA graphics card and separate monitor, an internal modem, or an ethernet card for attaching the Amiga to a local ►



ILLUSTRATED BY KIM WILSON EVERSZ

area network. Support for mono and RGB color displays on the Amiga monitor and full AT keyboard functions are also included—definitely a full-featured machine.

### Smooth and Simple

Setting up the software for the new Bridgeboard was almost too easy. I was prepared to insert the installation disk, open the Shell, and copy files manually to my Workbench disk. Instead, I found a full installation program that did all of the work for me. After making copies of my installation and Workbench disks (better safe than sorry), I double clicked on the BridgeInstall icon. Watching the program run revealed that Commodore knew what it was doing with the new system.

No longer do you have to be a techno-whiz to install software for the Bridgeboard. The program places all of the necessary files into available memory, then prompts you for a disk to install the new software on, including a hard disk. After you put in your Workbench disk, the program checks to determine if there is enough room for the new files. If more room is needed, the program displays the necessary amount and all the files on the disk. You simply tag the files you want to delete to free up more room for the Bridgeboard files. If you do not have an autobooting hard drive, run BridgeInstall twice—once to put the files on your Workbench disk and again to place them on your hard disk.

With the AmigaDOS software installed, all you need to do is set up the MS-DOS side of the computer. Insert the supplied MS-DOS disk in the 5¹/₄-inch drive and reboot. When the system is ready, open the PC drawer and double click the PCMono icon to access MS-DOS and the Bridgeboard. To invoke the Bridgeboard Setup utility, press the Control, Alt, and Escape keys simultaneously. This allows you to define the operational parameters of the Bridgeboard, such as the date, time, type of disk and hard drives that are installed, and how to use the one megabyte of memory. (Be careful: The date is displayed in the European format of dd.mm.yy.) Saving these settings will write them out to CMOS RAM. The settings are protected from power loss in this special memory section of the Bridgeboard by the lithium battery. The manual is very helpful, stepping through the entire installation routine.

### Take It for a Spin

Once I had the powerful machine running, I put it through its paces. First, I created a boot disk for MS-DOS by copying files from the supplied MS-DOS disk. The procedure was more entertaining than I expected. When I issued the command COPY *.* B:, the operating system shouted in German:

disk in Laufwerk B: einlegen!
Wenn bereit, eine beliebige Taste betatigen!

which I took to mean, "Place target disk in drive B: ►

## Soupin' It Up

IF YOU LIKE to tinker under the hood, you and your Phillips screwdriver can install the A2286 Bridgeboard and disk drive in less than an hour. Just follow the manual's step-by-step instructions, photographs, and illustrations. The tips below will help insure success on the first try.

1. Keep your working environment safe. First, remove all external cables from the computer. Moving the chassis is difficult and potentially hazardous when it is still attached to peripherals. Keep away from anything that could produce static while handling the card. Grounding yourself by touching some nearby metal before handling the card and disk drive is also a good idea.

2. Install the drive first; attaching its cables before you put in the Bridgeboard is easier. You will have to remove all other cards from the computer to access the drive's screw holes. I found when I wedged a small piece of cardboard under the drive that I could line up the holes for the screws a lot easier.

3. Attach the drive cable to the Bridgeboard before you insert the card in the computer. Do not try to reuse the drive cable from an A2088 Bridgeboard. The A2286 will not work with the older cable.

4. If the slot in your A2000 is tight, do not try to pound the board in. Make sure the connector edge of the board is lined up with the slot, and use your palms to apply steady, even pressure.

5. Once the board is in place, attach the lithium battery to the inside of the computer with the supplied velcro strips.

6. No matter how confident you are, test that everything works *before* you screw the cover back on. □ **—TT**

and strike any key to continue." Because there is only one MS-DOS disk drive, the computer fools itself into thinking it has two drives by turning drive A: into B: and prompting you to place the necessary disk into the drive. When it came time to place the drive A: disk back into the drive, I was greeted with the same message asking for drive A:.

I also created a virtual disk (partition) on the AmigaDOS hard disk. (See "The Great Pretender," p. 50, April '88). The first software I installed on the hard disk was Norton Utilities 4.5. The System Information program that comes with Norton revealed a Computing Index of 8.3 for the A2286. The A2088 previously rated an index of only 1.0, proving the A2286 runs 8.3 times faster than an IBM PC/XT (or an A2088 Bridgeboard). I also installed and ran through most of the DOS commands without any problems.

Slow screen updates on the Amiga monitor are a major drawback of using the A2088, because the Bridgeboard passes screen information to the Amiga graphics processors for translating. The Bridgeboard attempts to overcome this sluggishness by jumping a portion of the screen to allow the information to arrive on the screen in the same amount of time that it would take on an IBM monitor. The result is jerky text scrolling. This is even more pronounced with the A2286 Bridgeboard because it runs 8.3 times faster. For example, a small directory listing will just appear on the screen instead of scrolling up from the bottom. You can minimize this by using monochrome mode.

The jumpy scrolling thankfully does not carry over into the graphics realm. For CGA (Color Graphics Adapter) mode you must tell MS-DOS that you plan to run color graphics by entering the MS-DOS command MODE CO80. Next, go to the Amiga's Workbench and double click the PCColor icon to display CGA on the Amiga monitor. What amazed me is that the screen updating in CGA graphics mode is smooth and fully up to speed—no small feat when running something as demanding as the flight simulator (Falcon from Spectrum Holobyte) I was testing.

A new feature of the A2286 Bridgeboard is the ability to use the Amiga mouse as a Microsoft-compatible mouse on the Bridgeboard side. All you need to do is run the Amouse program from the Amiga side first, then from the Bridgeboard side. While on the MS-DOS side of the computer, you can switch the mouse mode by pressing the Left-Amiga and P keys at the same time.

My experiments worked fine; the mouse behaved exactly like the Microsoft mouse. The game I tested (Tracon from Wesson International) even used its own image of the mouse cursor instead of the Amiga mouse cursor. The Amiga mouse pointer remains on the screen in its last recorded position when you activate the IBM mouse mode. To avoid confusion, drag the Amiga mouse cursor to the bottom-right corner and then activate the IBM mouse mode.

The grease that keeps the system running smoothly is the Janus libraries that accompany the Bridgeboards. The basic function of the libraries is to let the Bridgeboard use resources on the Amiga side of the computer. For example, the Bridgeboard accesses the Amiga hard disk by using the Jdisk (MS-DOS), Jlink (MS-DOS), and PCDisk (AmigaDOS) programs. Another pair of MS-DOS programs, Aread and Awrite, allows you to transfer files between AmigaDOS and MS-DOS; again, both computers (the Amiga and the Bridgeboard) communicate with each other's drives.

One of the most important functions the libraries provide is the ability to use the Amiga parallel port for printing from the Bridgeboard side of the computer. Double click on the LPT1 icon in AmigaDOS' PC drawer to enable the parallel port for use by the Bridgeboard. While the Amiga can multitask, do not expect miracles. As with the mouse, if one side is using the port, then the other cannot. You must disable the parallel port by closing the "Parallel Printer Port Allocated" message box on the Workbench before the Amiga can use that same port.

New to version 3.6 of the Janus libraries that accompany the A2286 are the abilities to use the Amiga mouse as a Microsoft-compatible mouse and to reboot the Bridgeboard. As mentioned earlier, Amouse controls the mouse modes. To reboot, double click on the PCHard icon. While a keyboard reboot (press CTRL, ALT, and DEL simultaneously) cures most lock ups, the PCHard program rescues you from extremely nasty crashes.

## The Results Are In

The only drawbacks I found with the A2286 configuration were the jumpiness of scrolling text and the lack of a speaker. A quick-and-dirty remedy for the former is to buy an IBM-compatible monitor and install a monitor card in one of the slots next to the Bridgeboard. A little extra money solves the latter problem as well. The connections for the speaker are on the Bridgeboard; make a quick trip to a computer store and buy a standard IBM speaker.

These are minor details, however, compared to the satisfaction of being able keep up with the faster IBM microcomputers. The A2286 Bridgeboard is as compatible as any other IBM PC/AT clone on the market. Plus, with what other configuration can you work on MS-DOS projects from the office while you download a file from a BBS and render your latest 3-D objects in the background? The Amiga and A2286 are pulling away from the pack. ■

*Timothy Trimble is a systems analyst at Ashton-Tate. Write to him at 6034 Pacific Coast Highway, Apt. 9, Redondo Beach, CA 90277.*


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# Like Fish To Water: Mastering HAM Mode

# 11

A continuing series of tips, techniques, and tricks for creating more imaginative Amiga graphics.

**By Joel Hagen**

THE BEST PAINT packages are very intuitive once you have a little experience, but the first step can be intimidating. This is especially true for beginners learning to paint in Amiga's HAM (Hold-and-Modify) mode. This month's "Accent" presents an easy-to-master technique yielding complex subtleties of color that should help HAM novices get off to a good start. (More experienced users may also benefit—I use this simple technique for 90% of my own HAM painting.)

The Amiga's HAM mode offers 4096 possible colors on screen at the same time. This trick is accomplished by looking to the Red, Green, and Blue values of the preceding pixel on each scan line as you paint, and modifying those values toward the color with which you are painting. As only one of the RGB values can be changed at a time, it can take up to three pixels of intermediate color steps to arrive at the destination color. What results is a visible fringe of unplanned color on the left edge of a painted line or shape. This inevitable side effect of HAM painting—known as "ramping"—must be taken into consideration creatively from the outset. The final part of the technique outlined here conceals ramping within dithered edges as it simulates transparent brush strokes.

Amiga users currently have three choices among HAM paint programs: Photon Paint 2.0 (MicroIllusions, $149.95); the "Paint" component of the three-module Deluxe PhotoLab (Electronic Arts, $149.99); and Digi-Paint 3 (NewTek, $99.95). All three programs are good, and as you might expect, each has advantages and disadvantages. I will use terminology specific to Photon Paint, although you can employ the technique described here with either of the other two programs. (For further information, see the *AmigaWorld* reviews of each of these programs: Photon Paint 2.0, Sept. '89, p. 78; Deluxe PhotoLab, Dec. '88, p. 14; Digi-Paint 3, Nov. '89, p. 14.)

### Gone Fishing

Photon Paint's tool menu appears at the top of the screen. Double-click the first tool on the left in the top row, Free Draw (the box with the squiggle), to get the Free Shape tool. (You can also hit the D key twice to accomplish the same task.) The squiggle changes to a capital F to confirm your selection. You may now draw freehand shapes that will complete and fill upon release of the mouse button.

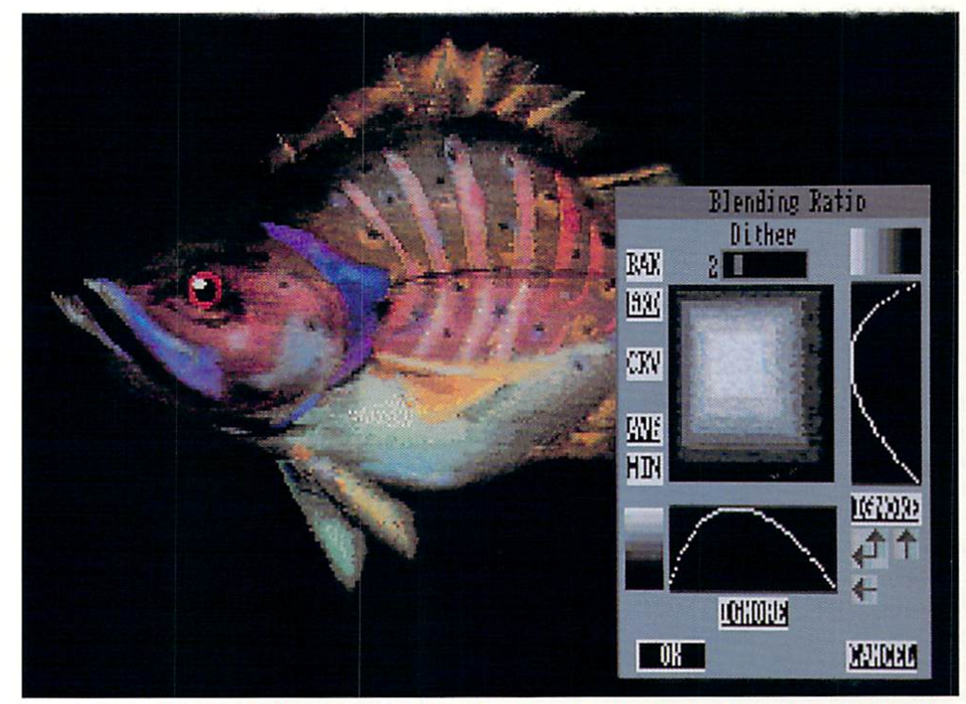
To get the feel of the tool, try drawing a fish. Build up the form of the fish little by little with free form shapes. Work with quick strokes to give a fresh feel to the shapes you create, rather than trying to laboriously trace each one with precision. The idea is to keep adding blobs of color with the left button while carving away to the background color with the right button. Think of it as drawing the shape of a brush stroke each time. Keep your other hand on the keyboard ready to hit the U key whenever you want to undo a blob and try again. Fish come in such an improbable array of successful forms that you can hardly miss coming up with something recognizably piscine. Change colors often as you work, and let the blobs overlap freely.

Do not spend too much time on this experiment. Solid colors are a crude use of the HAM mode, and ramping is severe. Press the Delete key to clear the screen and then hit F2 to put yourself in Blend mode. Try the same fish experiment. As you paint, the filled shapes are

**Using this deceptively easy technique, novices can enjoy the rich variety and subtlety of HAM-mode colors in about as much time as it takes to play "Go Fish!"**

now transparent. If you lay a blob of one color over another, a third color appears in the area of overlap. As you continue painting, these overlap colors multiply and the colors of the painting become more complex than the palette. The right mouse button still serves as an absolute eraser to the background color. This is handy for cutting the mouth opening into the front of the fish, trimming the tail to some rational shape, and reducing the free-wheeling contour to something vaguely hydrodynamic.

When you reach a point with two or three dozen colors built up in the painting, try another experiment. With the left mouse button, select the lower-right color in the palette as a foreground color. This color will be lost, to be replaced repeatedly by new colors in the next phase of painting. I think of this palette position as my scratch color. Hit "F10" to turn off the menu. Now use the comma key to pick colors directly from the screen. The whole painting becomes your available palette, and that palette grows in complexity with each transparent overlay you perform.




In our finished fish illustration, "Bluegill" (above), edges of color blend softly and the illusion of highlight can be seen. Also note Photon Paint 2.0's Blend Set requester (lower right), through which you can control saturation gradients and contouring, among other effects.

### Transparent Power

Clear the screen again for the next experiment. Hit ALT-M to bring up the Blend Set requester, as shown in the illustration. This is one of Photon Paint's most powerful tools (and you will find its equivalent in the other two programs). The filled shapes you have been drawing defaulted to 50% transparency. By clicking your cursor in the large window of the requester, you instead set a transparency gradient for those filled shapes. The window shows a representation of that gradient from full color saturation at the point you clicked, out to zero saturation at the edges.

Return to the painting screen and try another fish. Now the edges of color areas blend softly into one another and, owing to the saturation gradient, you can perceive an illusion of highlight. For even more subtlety, return to the Blend Set requester and draw your own contour graph in the box under the window. Keep the maximum height of the bell curve you draw down to about half the height (or less) of the box. Click the arrow under the other graph box to duplicate what you just drew. Set dither up two or three notches (as shown) to soften contouring effects. I created the accompanying fish illustration precisely by using this technique.

The lower the gradient curve in the requester, the more subtle the buildup of form and color. Gradual shading with black is most effective with very low curves. Keep in mind that the right mouse button background mode can also be set to Blend. You will quickly see that creating a palette of very light colors is advantageous. Darker values of these colors appear automatically as you paint. ■

*Joel Hagen's credits include work in art, astronomy, science fiction, and software development. Write to him at 10512 Sawyer, Oakdale, CA 95361. Please include a stamped, self-addressed envelope.*



# Scripts For Success Part 3

*Before they roll the credits and strike the set on their "scripts" series, our AmigaDOS directors will introduce some final—and very helpful—members of the cast.*

**By Mark L. Van Name and Bill Catchings**

IN THE FIRST two parts of our series, we learned how to enter and execute scripts, and ways to pass parameters to them. In the final installment, we will show you how some special commands can make your scripts more powerful and versatile by allowing you to control the order in which they execute their statements.

Scripts normally execute their commands in serial fashion—one after another in the order in which they appear in the file. There are many times, however, when you need more flexibility in the way your scripts execute. For example, you might want to vary the statements you execute depending on certain parameter values. Three special CLI commands—IF, SKIP, and LAB—are ready to do your bidding.

### Don't Fail Me Now

IF lets you test a condition, and if that condition is true, execute one or more statements. If the condition is not true, the script bypasses those statements.

Consider our simple script BACKUP from last column:

```
.KEY file,disk,new_name
COPY <file> <disk>:<new_name>
```

BACKUP works fine as long as you supply arguments for at least the <file> and <disk> parameters. Without them, however, the script will fail with an error from the COPY command. By using IF you ensure that BACKUP will not even attempt to perform the COPY unless there is a <file> argument:

```
.KEY file,disk,new_name
IF "<file>" EQ " "
  ECHO "You must supply a source
    file name."
  SKIP DONE
ENDIF
COPY <file> <disk>:<new_name>
LAB done
```

Let's go through this script a line at a time, starting with IF, which tests whether the <file> parameter is equal to (EQ) the null string (" "). If you do not supply an argument for a parameter, EXECUTE makes that parameter the null string. Thus, this test is true if you did not supply an argument for <file>, and false if you did.

If the test is true, IF executes all the statements up to the ENDIF command. (ENDIF's sole goal is to mark the end of those statements.) If the test is false, IF jumps to the first statement after the ENDIF.

In this example, if you did not supply a <file> argument, BACKUP uses ECHO to print a screen message to that effect and then jumps to the end via the SKIP command (which we will discuss below). If there is a <file> argument, BACKUP jumps to the first statement after the ENDIF and performs the COPY.

In this case, we followed instructions in the AmigaDOS 1.2 manual directing us to place double quotes (" ") around our <file> parameter. That way, if there was no argument for <file>, the IF becomes

```
IF " " EQ " "
```

which is clearly true. The AmigaDOS 1.2 manual states that if there is no argument for that parameter, failure to supply the double quotes necessary to make this test work will result in

```
IF EQ " "
```

which is bad 1.2 syntax and will fail. Actually, this is simply not true. Under AmigaDOS 1.3, the command

```
IF EQ " "
```

is perfectly legal; in fact, it is always true. You can put the double quotes around ►

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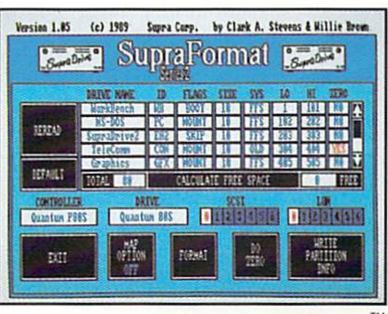
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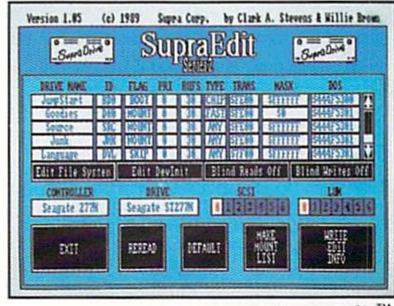
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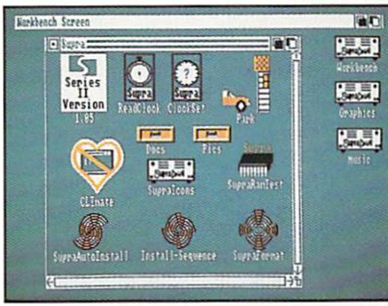



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the parameter name or not—it's your choice.

Notice also that we indented the commands between IF and ENDIF; it makes no difference to AmigaDOS, but we think doing so makes the script easier to read.

### THIS JOINT IS JUMPIN'

At this point, the other two special CLI commands we mentioned earlier can provide you with further help in getting more out of your scripts. SKIP lets you jump forward in a script, while LAB labels the lines to which you might want to jump. In our example above, we used SKIP to jump past the COPY command when there was no <file> argument.

To use these commands, simply follow them with a label name, as in

```
SKIP label
```

where SKIP searches forward, line by line, until it encounters a line of the form

```
LAB label
```

If there are several LAB lines with the same label, SKIP will go to the first one in the script.

If you wish, you may omit the label part of these commands. SKIP without a label searches forward until it finds the first LAB without a label.

In AmigaDOS 1.3, a BACK option allows you to SKIP to search backwards, as in

```
SKIP label BACK
```

or, for a backwards search for a LAB without a label

```
SKIP BACK
```

This version of SKIP goes back to the first line of the script and searches forward for the first LAB with a corresponding label (or the first LAB without a label, if the SKIP also has no label).

There is, however, one important restriction on the BACK option: You can use it to skip back only as far as the last EXECUTE command. If your script contains previous EXECUTE commands, SKIP will return to the nearest one and search forward from there.

In any case, make sure that SKIP can find the label you give it. If SKIP reaches the end of the script without finding that label, you will get the error message

```
Label "<label>" not found by Skip
```

and the script ends.

### LET'S COMPARE OPTIONS

Returning to the IF command, we find that you can use it for a lot more than merely comparing a parameter to the null string. In fact, IF allows you to compare a parameter to any string, and unless the string is null or contains spaces, it is not even necessary to place double quotes around it. Thus, for example, to see if the <file> argument is the specific file name "fred", use

```
IF "<file>" EQ "fred"
```

or, equivalently,

```
IF <file> EQ fred
```

Another IF option, the ELSE command, relieves you of the necessity of skipping around statements you do not want to execute when the comparison is false. IF, ELSE, and ENDIF work together in the following format:

```
IF condition
  command_set1
ELSE
  command_set2
ENDIF
```

If condition is true, the script executes the command(s) in command_set1 and then jumps to the first command after ENDIF. If condition is false, the script jumps immediately past the ELSE line and executes the command_set2 command(s).

To see these new options in action, consider this version of our sample script, BACKUP:

```
.KEY file,disk,new_name
IF "<file>" EQ "usage"
  ECHO "To use this script, you must
    supply three arguments:"
  ECHO "a source file name"
  ECHO "a destination disk"
  ECHO "a new name for the file on
    that disk"
ELSE
  COPY <file> <disk>:<new_name>
ENDIF
```

Here we check first to see if you supplied "usage" as your file argument. If you did, the script gives some instructions on its use and then jumps over the COPY; if you did not, it performs the COPY.

You can also nest IF commands—that is, put one IF inside another. When you do, each IF terminates with the first ENDIF command following it within the script.

There are many other IF comparison options, such as GT (greater than) and GE (greater than or equal to). Use NOT before any condition and you can invert the sense of that condition. For instance, to test for inequality, use

```
IF NOT "<parm>" EQ "string"
```

Similarly, using NOT and GE together gives you "less than," while NOT and GT yields "less than or equal to." All the above comparisons are string comparisons; they simply test whether two strings are the same, or if one is alphabetically greater than the other, and so forth. Another option, VAL, lets you make those comparisons numeric. For instance

```
IF "<num>" GT "5"
```

compares the string <num> to the string 5. If, say, <num> were 9999, the comparison would still be false because 9999 is not alphabetically greater than (or less than, for that matter) 5.

If, however, you add the VAL option

```
IF <num> GT 5 VAL
```

9999 will indeed test numerically greater than 5. VAL even allows you to use negative numbers. (Note that we have omitted the quotes because it does not appear natural to use them with numbers.)

You can also compare the value of environment variables, as well as parameters, strings, and numbers. Simply supply a dollar sign ($) before the name of the environment variable, as in

```
IF $my_env_var EQ "do_it"
```

To see whether a string is the name of a file that currently exists, try Another IF option, EXISTS, as in

```
IF EXISTS file_name
```

►

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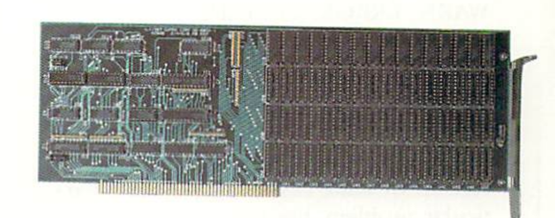
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Similarly, to verify that a file does not already exist, use IF NOT EXISTS.

### A Margin for Error

As you might have realized by now, the IF command is a real workhorse. It also allows you to check another set of special conditions that you may find very useful: WARN, ERROR, and FAIL. These three tests let your scripts handle commands that do not succeed.

Without these options, your script will simply stop when a command fails and its error message appears on your screen. In some cases, this poses no particular problem, but you will find other instances where it is very inconvenient not to have your script handle such errors and keep working.

Start by entering these options. When a command fails, it sets what is called a "return code," a number indicating the seriousness of the command failure. By AmigaDOS convention, a return code of 0 means success. Three return-code numeric ranges define three levels of failure:

| | |
|---|---|
| >=5 and <10 | warning |
| >=10 and <20 | error |
| >=20 | complete failure |

The three options let you test for these return code ranges. IF WARN is true if the return code of the previous command is five or more. Therefore, it is true even if you actually have an error or a failure. Similarly, IF ERROR is true if the previous command's return code is 10 or more, and IF FAIL is true when you have a return code of 20 or more.

By default, AmigaDOS scripts have a "fail level" of 1—that is, they keep running as long as every command's return code is 9 or less (success or a warning). The script will stop only when it encounters a command with a return code of 10 or more. You can change this level, however, with the FAILAT command, as in

```
FAILAT 20
```

By inserting this command, your script will execute as long as the return code of all commands stays below 20.

To use FAILAT and the three condition tests successfully, you must follow two rules. First, issue the FAILAT command before any command whose failure you plan to test. Second, use the three options only when the fail level is appropriately high: 6 or more for WARN, 11 or more for ERROR, and 21 or more for FAIL. Thus, to test for ERROR or FAIL, you must first issue an appropriate FAILAT command. If you neglect to follow these rules, you can still write IF ERROR and IF FAIL commands, but the script may never get to them because it will stop when it encounters a command with an error.

Enough about scripts. If you want to learn more, study some of the fairly complex scripts in your /s directory and, of course, write your own. We hope you have enjoyed our series on scripts and will indeed find some "success" in using them. ■

*Mark L. Van Name and Bill Catchings are contributing editors to* AmigaWorld. *Write to them at 10024 Sycamore Rd., Durham, NC 27703.*

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# Implementing the iff.library

By Michael Bodin

*Editor's Note: Welcome to the first installment of our monthly column on Amiga programming, which will cover C, BASIC, Modula-2, and ARexx. Each month, a different guest columnist will share advice and provide techniques for his language of choice.*

WHAT'S A PROGRAMMER to do? IFF (Interchange File Format) is a wonderful file standard, but with no standard way of implementing it.

To the rescue comes Chris Weber from Zurich, Switzerland and his iff.library, the first attempt at a standard for reading and writing IFF files. The library provides a set of very useful tools that allow you to develop IFF compatible programs without re-inventing the wheel each time you write IFF support code. Although these routines are geared mainly for graphic IFF files, they are flexible and can be used for Anim (animations), 8SVX (sound), or SMUS (music) files. The functions available are:

- ifffile = OpenIFF(filename)—Allocates any available memory for an IFF file and then loads it in.

- ifffile = NewOpenIFF(filename, memattr)—Allocates specific memory for the IFF file and then loads it in.

- CloseIFF(ifffile)—Closes an IFF file and deallocates the memory created by OpenIFF( ).

- header = GetBMHD(ifffile)—Finds the BitMapHeader chunk within an ILBM image file.

- count = GetColorTab(ifffile, colortable)—Finds the CMAP chunk and converts it to a ColorTable.

- result = DecodePic(ifffile,bitmap)—Decodes the BODY of an ILBM file into a bitmap structure.

- result = SaveBitMap(filename,bitmap, colortable,flags)—Saves the contents of the BitMap as an IFF-ILBM file.

- result = SaveClip(filename,bitmap,colortable,flags,xoff,yoff,width,height)—Saves a part of the overall BitMap as an IFF-ILBM file.

- viewmodes = GetViewModes(ifffile)—Gets the ViewModes word.

- chunk = FindChunk(ifffile,chunkname)—Finds the first occurrence of the specified chunk id. (ILBM, 8SVX, etc.)

- error = IffError( )—Returns a more detailed error code after a library function has failed.

Before you can start coding, copy the iff.library to the libs: directory of your Workbench disk, and copy the iff.h include file to a backup of your include-files disk. Iff.h must be called in your source code to allow you to use the library definitions. If you use Lattice C, you will find a pragma file that comes with the library's zoo file. Place these pragma definitions into your source code along with the include statements for the iff.h header file. Be aware that SaveClip( ) has eight parameters and Lattice's pragma definitions can handle only six. If you try to use SaveClip( ) you will get a linker error. If you are not using Lattice, you must assemble the library stub routines included in the zoo file, then link their object code along with other standard library modules. You may use the SaveClip( ) routine only if you assemble the library stub routines.

### IFF in Action

Listing 1, QuikShow.c, is a compact IFF file viewer that demonstrates the power of these functions. It was written with Lattice C 5.02. To run it from the CLI, type QuikShow <filename>. The program opens an IFF picture file (filename), displays it, and exits.

Let's look closer at QuikShow. Notice that the IFFBase is declared as a pointer to a Library struct. This is the one declaration you must make that is not in the iff.h header file. The program starts at main( ) by checking the input. If the user has typed a question mark or used improper syntax, the program prompts the user with the proper syntax for the command, then exits.

If a filename is given, the program opens the Graphics, Intuition, and IFF libraries. The program then calls the OpenIFF( ) function from the IFF library. This function opens the file named on the command line, checks if its file type is IFF, allocates memory for the file, and loads it in. Note that the memory used might be chip or fast RAM. When using the New- ►

**Where to find iff.library**

| Network | Area | Location | Title |
|---|---|---|---|
| CompuServe | AmigaTech Forum | LIB #1 | IFFLIB.ZOO |
| PeopleLink | Amiga Zone | Sec. #11 | IFF_LIB_LAT.ARC |
| GEnie | Amiga Starship | Sec. #13 | SHOWIFF2.ZOO |
| Lattice BBS | Amiga | Amiga Files | IFLIB161.ZOO |

OpenIFF( ) function, you can specify the exact type of RAM.

Once the file has been successfully opened, the program checks the file for a BitMapHeader chunk. If QuikShow finds the BMHD chunk, it sets up the screen structure according to the header definition. The screen's width, height, and depth are all set from the incoming picture file. Next, the GetViewModes( ) function gets the ViewMode words (HIRES, HAM, etc.) and enters them into the screen structure. Finally, the program opens the viewing screen.

With the screen ready, the program needs the rest of the picture file. GetColorTab( ) gets the color register definitions from the file and converts them to a ColorTable structure to be used with the LoadRGB4( ) graphics library function. This sets the screen's colors to those defined in the IFF picture file. QuikShow next calls the DecodePic( ) function. With this one command you decompress the file and then display it in the view screen's bitmap. The Delay( ) function inserts a pause before the program closes down the IFF file, the screen, and the libraries.

### Sound Statements

Although the example deals with graphics, loading a digitized sound file is equally quick. After you open the file using OpenIFF( ) or NewOpenIFF( ), use FindChunk( ) to locate the proper chunks for an 8SVX file, the VHDR (VoiceHeader) and BODY chunks. Then set your program's attributes according to the file parameters.

You can find Chris' freely distributable iff.library file on most of the major networks (see table). The current version of the file is 16.1 and dated 01-DEC-88. The library itself consumes a mere 2352 bytes, and its routines provide a much needed step towards a standard. The iff.library is well worth the few minutes you will spend downloading it. □

*Mike Bodin is System Manager for Florida's State Division of Elections. Write to him c/o* AmigaWorld, *Editorial Dept., 80 Elm St., Peterborough, NH 03458.*

**Listing 1. QuikShow.c—an example program using the iff.library routines.**

```
/* QuikShow.c - based on ShowIFF.c by Christian
 *  A. Weber. Feel free to use or modify it. */

#include <exec/types.h>
#include <graphics/gfxbase.h>
#include <intuition/intuition.h>
#include "iff.h"

/* for Lattice Compiler */

#include "IFFpragm.h"

struct Library *IFFBase = NULL, *OpenLibrary();
struct GfxBase *GfxBase = NULL;
struct IntuitionBase *IntuitionBase = NULL ;
struct Screen *myscreen = NULL, *OpenScreen() ;
APTR ifffile = NULL ;

struct NewScreen ns =
{
  0,0,0,0,0,0,0, NULL, CUSTOMSCREEN|SCREENQUIET,
  NULL, "QuikShow", NULL, NULL
};

main(argc,argv)
int argc;
char **argv;
{
  long count = 0;
  UWORD colortable[128];
  struct BitMapHeader *bmhd;

  if((argc != 2) || !strcmp(argv[1],"?"))
  {
      printf("Format: %s filename\n",argv[0]);
      exit(20);
  }

  GfxBase = (struct GfxBase *)
            OpenLibrary("graphics.library",0L);

  IntuitionBase = (struct IntuitionBase *)
            OpenLibrary("intuition.library",0L);

  if(!(IFFBase = OpenLibrary(IFFNAME,IFFVERSION)))
    {
      printf("Copy the iff.library to your LIBS:");
      printf(" directory!\n");
      exit(10);
  }

  printf("Loading file %s ... ",argv[1]);

  if(!(ifffile=OpenIFF(argv[1])))
     Fail("Error opening file");
  if(!(bmhd=GetBMHD(ifffile)))
     Fail("BitMapHeader not found");

  ns.Width       = bmhd->w;
  ns.Height      = bmhd->h;
  ns.Depth       = bmhd->nPlanes;
  ns.ViewModes   = GetViewModes(ifffile);

  if(!(myscreen = OpenScreen(&ns)))
      Fail("Can't open screen!");

  count = GetColorTab(ifffile,colortable);

 /* Limited to 32 color registers */
  if(count>32L) count = 32L;

  LoadRGB4(&(myscreen->ViewPort),colortable,
     count);

  if(!DecodePic(ifffile,&myscreen->BitMap))
     Fail("Can't decode picture");

  Delay(250L);

  Fail("done"); /* Close the whole stuff */
}


Fail(text)
char *text;
{
    if(ifffile) CloseIFF(ifffile);
    if(myscreen) CloseScreen(myscreen);

    printf("%s\n",text);
    printf("IffError = %ld\n",IffError());

    if(IFFBase) CloseLibrary(IFFBase);
    /* MUST be closed when done! */
    CloseLibrary(IntuitionBase);
    CloseLibrary(GfxBase);
    exit(0);
}
```

■

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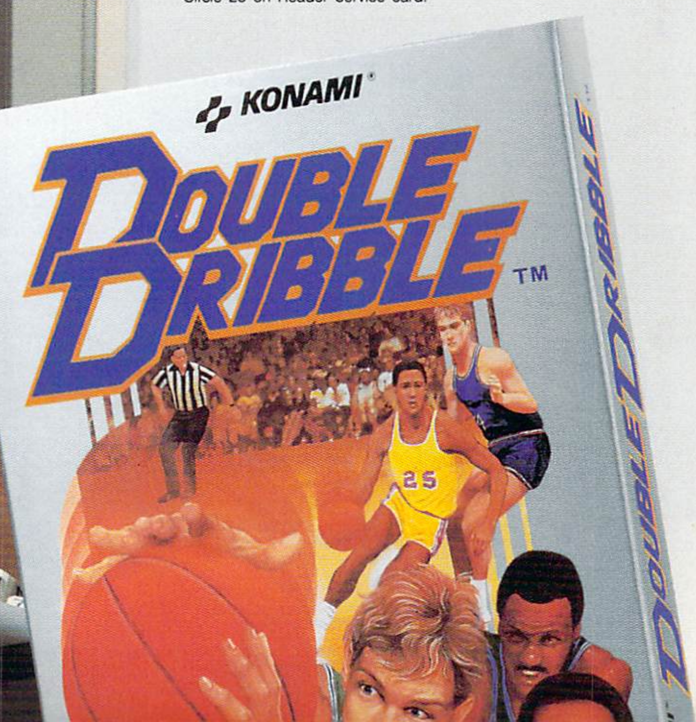


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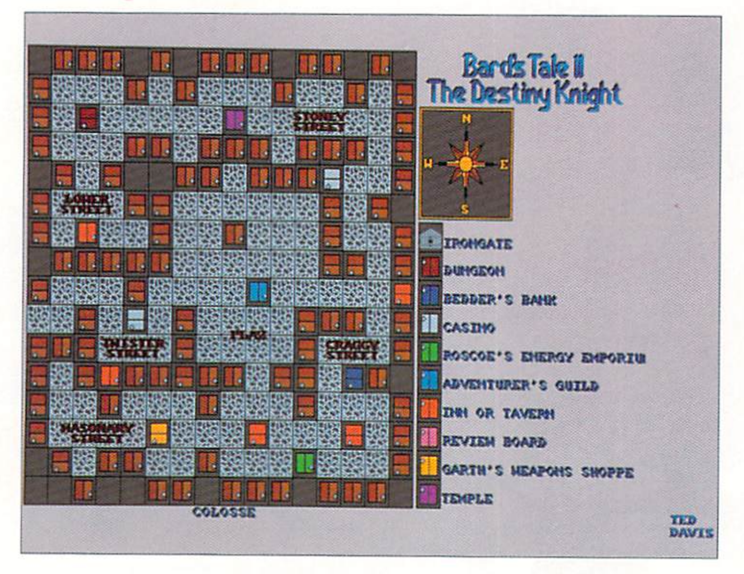

# Cheating by Any Other Name

*The Machiavellian way to play.*

**By B.G. Hunter**

WINNING IS EVERYTHING. The ends justify the means. Find an inside source and make it leak until it's dry.

Aside from kidnapping the programmer, the easiest way to get tips on winning a particular game is to buy a hint book about the game. Their formats range from photocopied pages that explain the steps you need to complete the game (such as Mindscape's *Deja Vu Clues and Hints* for $4) to staple-bound books with detailed maps, hints, and instructions (such as Electronic Arts' *Bard's Tale II Clue Book*, for $12.95).




Even more complete is *Falcon Air Combat* by Joe Bonanni (McGraw-Hill, $14.95) with over 200 pages of information on Spectrum HoloByte's Falcon flight simulator. The book even includes keyboard templates printed on heavy card stock.

### "Right This Way"

If you need help with a variety of games, you should consider one of the general hint books. *Quest Clues*, edited by Shay Adams (Origin Systems Inc., $24.99), for example, discusses 50 adventures and includes maps and walk-throughs. The walk-throughs are particularly nice if your goal is just to complete the game. The clues are in code, such as "Take the XNUHTR;" you translate only the parts you need. The problem with these general hint books is that they aren't dedicated to Amiga games. Still, if you have even a few of the games that a book covers, it might be worth a look.

An interesting alternative is The Ultimate Hint Kit (Elkon Enterprises, $19.95). Rather than a book, the Kit is three disks of walk-throughs, hints, and maps for over 25 Amiga adventure games. The attractive maps are a bit frustrating, however, because the Kit does not give you any simple way to print them. The Ultimate Hint Kit also contains what may be the ultimate cheating tools—character editors. A char- ►

**The Ultimate Hint Kit: better than Rand McNally.**




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acter editor lets you change the attributes of the characters in role-playing games. Tired of slowly building up your experience points? Just use the character editor for Bard's Tale, Faery Tale Adventure, or Phantasie, and you can have more hit points than you ever dreamed possible. The material in the Ultimate Hint Kit comes from many different sources. I recognized some of the text from various on-line networks.

**TIPSTERS' ENCLAVE**

One of the most important of these services for gamers is CompuServe, where you can find hints, tips, and character editors. A good starting place is the Game Forum (once on line, type GO GAMECON), which offers a number of options. First, check out The Electronic Gamer (GO TEG), an on-line magazine that contains walk-throughs, hints, and reviews of hundreds of games. It isn't limited to adventure games—almost 50 sports games were reviewed at last count. Even though the information on CompuServe more heavily favors the world of IBM PCs than Amigas, you can spend your life on line hunting down clues (or at least as much of your life as you can afford at CompuServe's hefty $12.50 per hour rate.)

If you've got even more money to burn, try the participatory games forum, The Gamers' Forum (GO GAMERS). It has the usual reviews, hints, and walk-throughs, plus such goodies as flight-simulator check-lists and tips from other gamers. Here you can exchange information with other gamers. You can routinely find hundreds of messages on all kinds of games. The messages themselves are often also entertaining, as the people posting them adopt special gaming personas.

The ability to exchange messages really pays off when you're stumped. Just post your question and sit back and wait. Someone will be only too glad to answer your question or give you a hint. The PeopleLink and GEnie networks offer similar forums (The Toy Box and Recreational Software, respectively) in their Amiga subsections (Amiga Zone and Amiga StarShip). You could even leave a hint of your own—unless you don't want anyone to win before you do. □

*Although not the type to be caged in an office, B.G. Hunter does skulk in occasionally to pick up his mail. Write to him c/o* AmigaWorld, *Editorial Dept., 80 Elm St., Peterborough, NH 03458.*

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# GAME REVIEWS

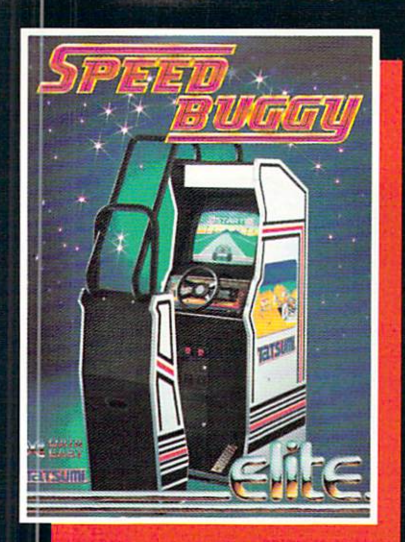
## SHOOT 'EM UP CONSTRUCTION KIT

**By Bruce Jordan**

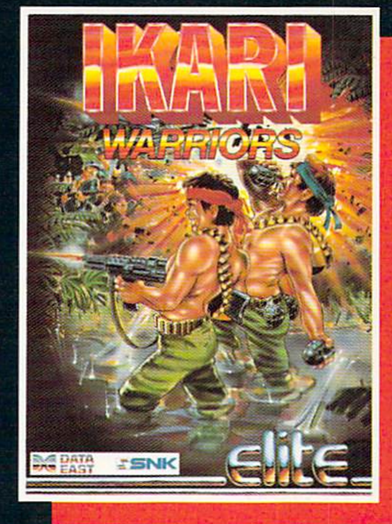
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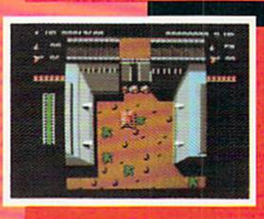
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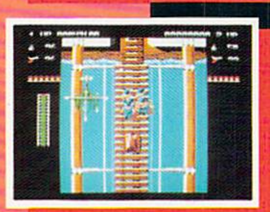


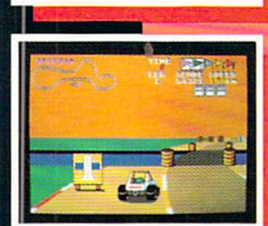
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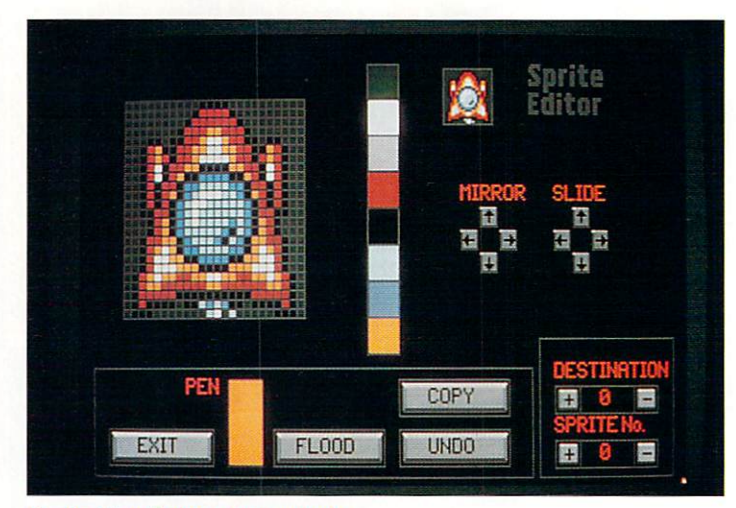
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the IFF Sound Editor. Create your imaginary landscape, map it, and determine where levels begin and end via the Background Editor. The Aspects Editor utilities give you control over enemy object placement, how they will attack, how many points for a kill, how hard they will be to kill, what they will sound like, and more.

The Master Games disk contains three games created with the Construction Kit: SpaceHawk, BloodnBullets, and Psychblast. Play them for fun or use them as examples of how to build a game.

If you build a game that you are especially proud of, you can even market it. Accolade has no objections as long as you give proper credit, and you include a disclaimer stating that Accolade is in no way responsible for your game.

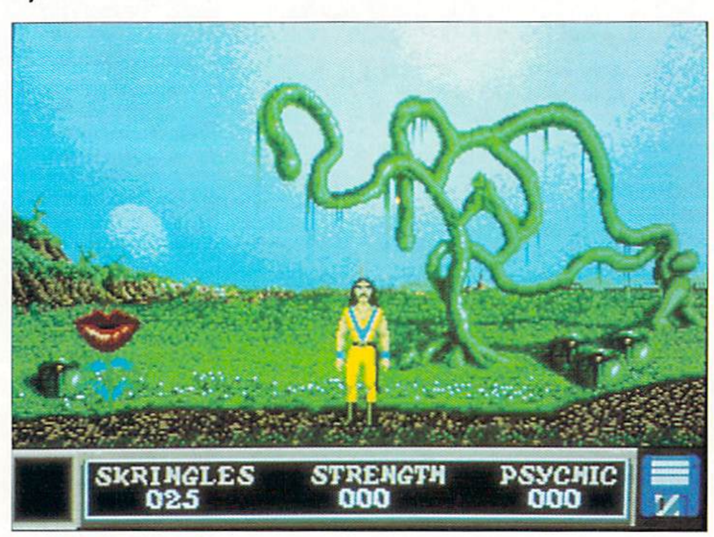
The Shoot 'Em Up Construction Kit will take your wildest ideas and make you an arcade game wizard. You'll finally have that game you always wanted, and you may even make a buck or two! *($19.95, Accolade, 550 S. Winchester Blvd., Suite 200, San Jose, CA 95128, 408/296-8400. No special requirements.)*



Create, then destroy, your enemies.

## THE KRISTAL

**By Peter Olafson**



Repair the force of harmony.

BASED ON A stage musical, The Kristal is a four-disk game of exploration with occasional arcade sequences of sword fighting and alien blasting.

You are space pirate Dancis Frake on a quest for the hidden Kristal of Konos, which held together the force of harmony. (Pray for salvation from people with silly names going on quests for silly misspelled objects.)

When you get into the game, it doesn't seem so silly. Kristal immediately impresses with a lengthy digitized-speech introduction and a beautiful smooth-scrolling tableau. The backdrops are works of art that you can walk around in.

You explore via a combination of controls. The joystick directs Dancis in the four cardinal directions. Function keys pick up, examine, and use his inventory. You don't actually see objects on the ground; they're featured in a flashing box if they're hidden nearby. Walk absolutely everywhere. The only typing comes when you try to converse—politeness counts. For space travel, select one of the 10 planet icons. Getting down to the surface is a nastier affair, as aliens have something to say about it. Dogfights are difficult to master, but sword fighting is easier with 16 joystick-controlled moves.

The game is a trifle limited in places. The conversation system offers relatively sophisticated responses, but Frake can only speak when spoken to. While the backgrounds are sumptuous, they lack interactivity. Look, but don't touch.

At least there's lots to look at; The Kristal is a gorgeous hunk of a game. It will generate plenty of light and heat to charge your Amiga for a Saturday afternoon of fun. *($49.95, Cinemaware Corp., 4165 Thousand Oaks Blvd., Westlake Village, CA 91362, 805-495-6515. Joystick required.)* ►

## F40 Pursuit Simulator

**By Rick Teverbaugh**

IF THERE WERE nothing more to car chases than this, *Smokey and the Bandit* would never have been filmed. If driving fast were only as much fun as F40 Pursuit Simulator, Mario Andretti would have an Italian restaurant in Indianapolis.

The story in F40 is that you and your Ferrari F40 must get from point A to point B in a short amount of time, so short that occasional 200 mph runs will be necessary. The cops get mad, and they chase you. Before you leave, plot your route from the map, then fold it away. The map does not display the position of your car along the route. You begin with 20,000 points at each stage of the trip. The longer it takes you to complete your mission, the more points you lose. You can gain back 10,000 points, however, for busting through a police barricade. End of plot.

If you like explosions, this is your game. If the tank-like police cars slide into your Ferrari, you go up in a ball of flames. You can do 360-degree spins, but don't try 180s to change direction. Hit a couple of the posts surrounding the roadway and you'll explode. Should you make it out into the grass and drive for very long, the car will just explode as punishment. If you lose control at over 90 mph, be prepared to explode or to come to a screeching halt. Trying to distinguish among the 12 indicators on the three-inch dashboard instead of watching the road is equally deadly.

For looks and sound, F40 Pursuit is right near the top of the class, but in terms of performance, the program more resembles a Volkswagen than a Ferrari. *($44.95, Titus Software Corp., 20432 Coriso St., Chatsworth, CA 91311, 818/709-3692. No special requirements.)* ►




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# Ikari Warriors

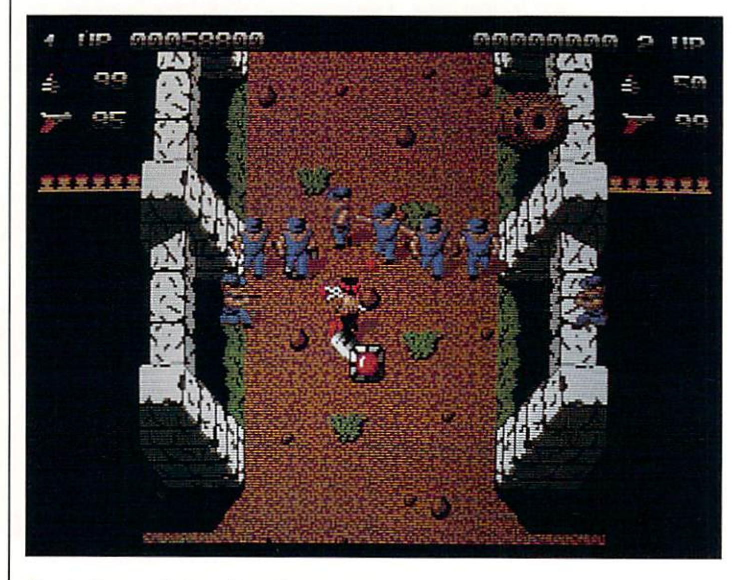
**By Peter Olafson**

THE AMIGA VERSION of Ikari Warriors is almost as violently seductive as its arcade parent.

You (and a pal, if you wish) walk up the screen to rescue some fool general who is held captive in his Central American headquarters by revolutionaries. Standing in the way are the usual hordes of men in blue and red suits (who have only one life each to your six), pillboxes, mines, booby traps, tanks, and fortifications. Luckily you'll also find an enchanting variety of destructive powers to lay them waste. The one-button joystick controls make wiping out your foes even easier than it was on the two-button arcade machine. Kill the soldiers in red suits and you're rewarded with a power pill.

The designers paid attention to detail. The music is jaunty. The scrolling is smooth and the animation is well done, right down to the pumping muscles on the Ikari's backs.

Most agreeable, the Amiga version is easier than the arcade game. In the original Ikari, the enemy soldiers were on top of you from the start. In this version, some are stupid; they just stand and look at you. While the enemy tried to kill me with stares, I came across helicopters, a monster tank, and a whole town I never knew existed.



Crush the revolution, free the general.

My only objection is the manual. It omits startup procedures for the Amiga and a description of game mechanics. You won't need much guidance, however. Once I picked up Ikari Warriors, I could not put it down. Kill some revolutionaries for yourself and see. *($39.95, Elite Systems Ltd., distributed by Keypunch Software, 1221 Pioneer Building, St. Paul, MN 55101, 612/292-1490. Joystick required.)* ■

*from p. 16*
expensive and less greedy with RAM. The new real-time spell-checking capacity is a plus, and the program in general operates faster than Pen Pal. For these reasons, ProWrite is a better bet than Pen Pal for those who want a screen-font-based word processor to multitask with a database or any other application.

**Pen Pal**
***Brown-Wagh Publishing***
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$149.95
*One megabyte required.*

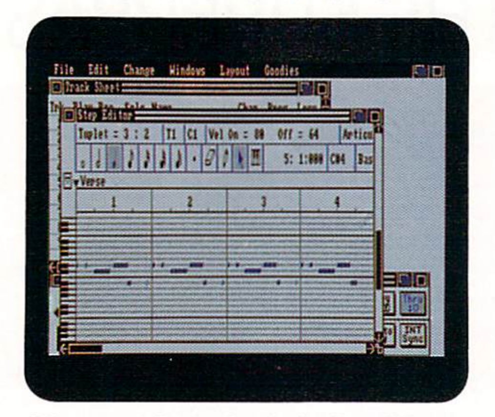
**ProWrite 2.5**
***New Horizons Software***
206 Wild Basin Rd.
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Austin, TX 78746
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$124.95
*No special requirements.*

## Master Tracks Pro 3.0

*You've got a friend in MIDI.*

**By Steve Quinzi**

AND NOW FOR something completely different...a powerful MIDI sequencer that is actually user friendly! A newcomer to the Amiga market, Master Tracks Pro has been available in Atari and Macintosh formats for some time now. This graphically oriented, 64-track MIDI sequencer won't load with less than a meg of RAM, and because it does not support Amiga samples, you will need at least one external synthesizer and a MIDI interface to make music.



Take one track at a time in the Step Editor.

### Box by Box, Row by Row

Most Master Tracks operations are handled in three windows: the Track Sheet, the Transport Window, and the Song Editor Window. The Track Sheet is neatly laid out with 64 rows representing the tracks. Each row has one box in which you can play, record, or solo that track, and another box indicating the track's name, MIDI channel assignment, looping status, and program change assignment (the latter applies only to the basic setting; the number in the box does not change to reflect program changes). I like this setup for its clarity, but it requires needless extra steps: To change a value in a box, you must click on the value, go to the dialog box that pops up, delete the old value, and enter the new one. I would like to change values just by clicking in the track box and entering.

The Transport Window controls the movements of the sequencer. As is typical in sequencing programs, it resembles a tape recorder, with buttons for play, record, pause, stop, rewind, and fast forward. The fast forward and rewind functions move quickly through the sequence when you click and hold down the right mouse button. Single clicking on either of these is supposed to move measure by measure, but instead jumps you around erratically. On the right side of the window are buttons for punch in/out, count off, MIDI thru, auto rewind (which automatically rewinds to the last location that the sequencer started from), Sync (internal, external MIDI, or MIDI Time Code), and a Key button that holds the sequencer (in play or record mode) until you play a note on your MIDI controller. Still further to the right are two counters, one indicating measures, beats, and clocks (240 per quarter note), and another indicating elapsed (real) time. You can locate the sequencer to a specific measure by entering its number into the measure counter.

### Bar None

The Song Editor displays each track as a row of bars, each bar representing a measure. If there are notes recorded in a particular measure, the corresponding bar appears solid; if not, it appears hollow. A ruler runs across the top of the uppermost track, indicating measure numbers from left to right. This window makes it incredibly easy to see what is going on with your music.

To make things even clearer, you can place markers at any measure to designate sections of the song (verse, chorus, and so on). You can set your markers to move with the music in the event that the tempo changes, or to remain at the same SMPTE location regardless of tempo. The Amiga's Tab key moves the sequencer from marker to marker, but you can also cue the sequencer to a spot just by placing the cursor on that location. Putting your song form together by copying and pasting is unbelievably easy: Just highlight the measures you want to duplicate, select Copy from the edit menu, click on the desired destination, and select Paste. Tracks can be bounced together in the same way by selecting Mix Data from the edit menu.

To perform global editing, simply highlight a region and select a command from the Change menu. The Channel option changes the MIDI channel, while Duration alters note lengths by percent or by setting all to a static value. Velocity can set all velocities to a static value, add a given number to all existing values, scale, or change by percent. Continuous affects continuous controller data in the same way as Velocity does, and can also map one controller type to another. Strip Data removes selected data types or note ranges from a track (you can then copy the data to another track). Transpose reverses positions, and Humanize introduces random variations in




Using Master Tracks is almost like working with a real musician. All editing is done graphically. It's great for non-computer people.

—*Mark Stepp*
*Athens, GA*




I was familiar with Master Tracks on the C64 and checked prices on other formats, then decided to buy an Amiga and Master Tracks together. I like it because of the graphics. The program is so easy to use. . .you don't even need the manual.

*—Kelly Craven*
*Greenville, NC*

the rhythms, durations, or velocities (within a given range) to take away the stiff feel that usually results from step-time programming or ruthless quantization. You can choose Quantize to affect rhythms and/or durations within a given range of the beat, and to specify quantization by percent. Finally, Fit Time changes the tempo of the selected region so that it will fit in a given time space.

### Step on a Track

Another major window is the Step Editor. It displays individual note information for each track, but unlike the Song Editor, shows only one track at a time. By changing the number in the T box at the top of the window you can switch from one track to another. This window is set up as a row of boxes, representing measures, with the measure numbers and markers across the top. Notes appear as horizontal bars within the boxes. The vertical placement of the bars indicates pitch, while horizontal orientation indicates location in time, and the length of the bars represents duration. As you move the cursor around in this window, two readouts tell you your pitch and your location in time. Double clicking any individual bar brings up a dialog box that displays pertinent information about that note. You can change any of the values, and draw in, move, or erase notes. You can zoom in for close work, zoom out to see more measures at once, and make global changes by highlighting regions of notes and selecting a command from the Edit or Change menus. You can also program in Step Time by using a MIDI keyboard to enter pitches and Amiga keyboard commands to enter durations and rests.

Still other windows are available, one of which displays controller data and tempo graphically. While such control is also available in the Change menu, here, as in the Step Editor, the process is visual: Data can be edited or drawn in with the mouse.

From the Goodies menu you can access the Conductor track, where all meter and tempo changes are displayed. You can set synchronization options in MIDI Setup (internal, external, MTC, SMPTE, and SMPTE start time). While I like Master Tracks' timing and sync capabilities, there is no provision to disable MIDI start when using internal sync. This is a problem when you use a drum machine that cannot disable MIDI start as your sound source, and you do not want its clock to run. Because Master Tracks sends a MIDI start message when its sequencer begins, it starts the sequencer in your drum machine.

Other Goodies goodies include a Sysex recorder that lets you record and store system-exclusive information for devices not requiring a handshake. A Keyboard setup window facilitates step-time programming by allowing you to map notes from a MIDI keyboard to the transport controls. With the Click set up you can customize the metronome click somewhat (internal sample or out thru MIDI with or without downbeat accents). A record filter can sift out selected data on input.

### Near Perfect

I have only two major criticisms about Master Tracks Professional, but unfortunately, both are rather serious. The program gets sluggish as your song increases in size, and it is more prone to crashing than I think it should be. I hope Passport addresses these shortcomings, because otherwise Master Tracks is a great program. While it is not as powerful as Dr. T's KCS level II, or as comprehensive as Music-X (MicroIllusions), it is undoubtedly the clearest, most user-friendly Amiga MIDI sequencer I have seen so far. Powerful enough for pros, Master Tracks is also easy enough to learn that even rank beginners can make music almost immediately after picking it up. Apparently Passport is not resting on its laurels; at press time we received an update that claims increased multitasking capabilities with other MIDI applications and a SMPTE-generating capacity. My wish list for the next update includes more velocity-editing features.

**Master Tracks Professional**
***Passport Designs***
625 Miramontes St.
Half Moon Bay, CA 94019
415/726-0280
$395.00
*One megabyte required.*

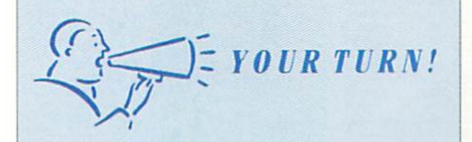
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*—Ed Leffler*
*Orlando, FL*

My husband was not impressed with the Amiga until Mac-2-DOS came along. With it, I can transfer color digitized Amiga video to a Mac II. It saves me money.

*—Cheryl Peterson*
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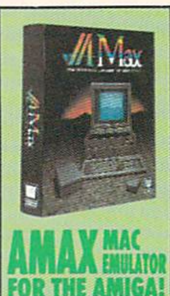
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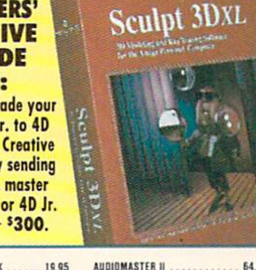
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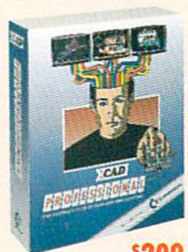
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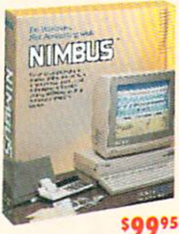
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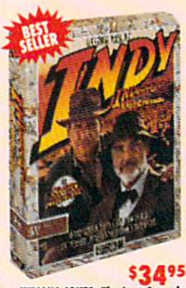
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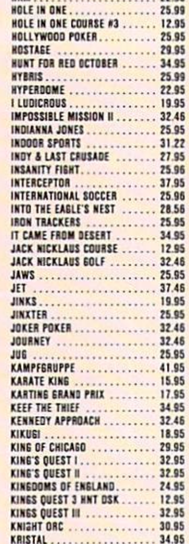
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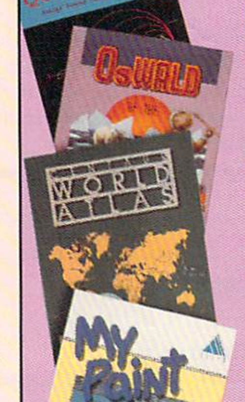
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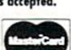
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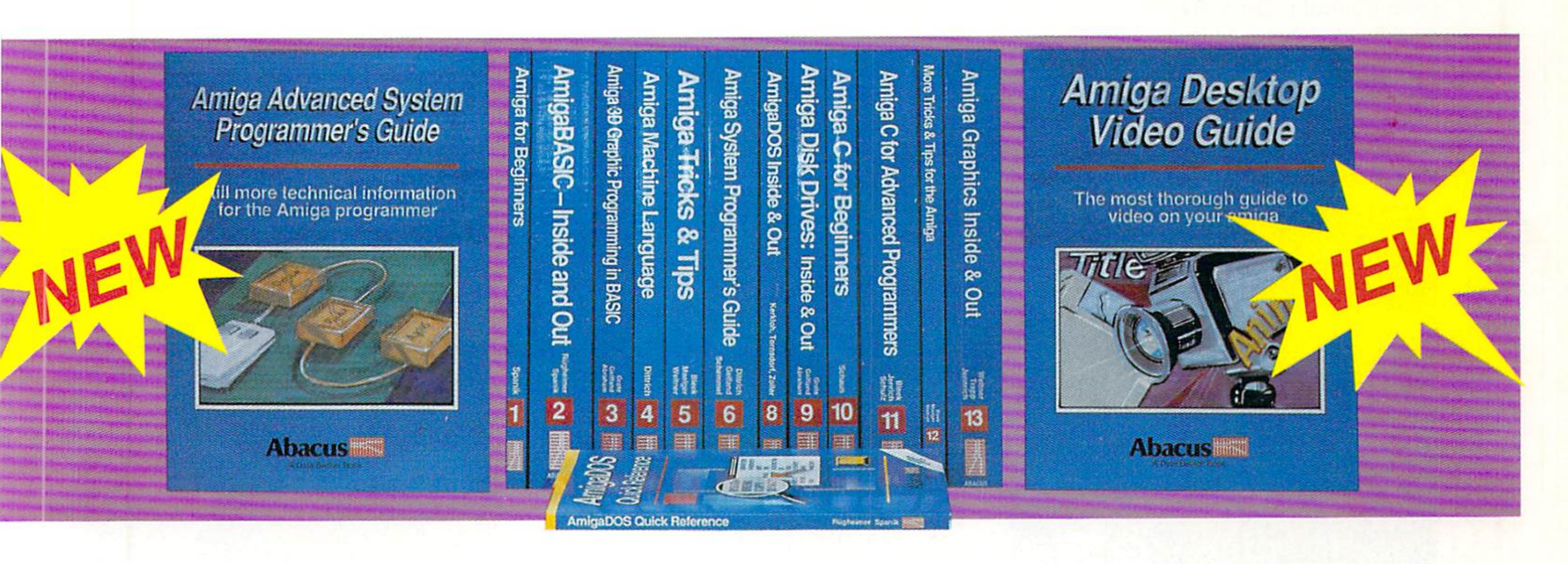
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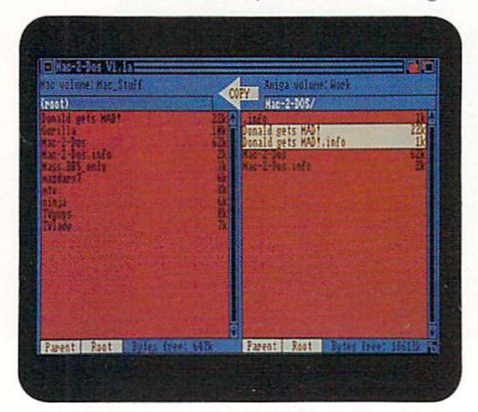
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tosh, MS-DOS, and Atari ST disks come to visit your Amiga.

### HEY, MAC!

Unlike A-Max (ReadySoft), Mac-2-DOS's purpose is not to run Macintosh software from an Amiga. Rather, Mac-2-DOS from Central Coast Software lets you transfer data between the two otherwise-incompatible systems.

Mac-2-DOS comes in two configurations. If you have access to an external Macintosh floppy drive, you should purchase the software-only version, Package



**Highlight files and click the arrow to transfer.**

A. Package B comes with a Mac-compatible disk drive that works as either a Mac or Amiga drive. Both setups include a non-copy-protected disk, a 33-page manual, and a matchbox-size interface for connecting the Mac drive to your Amiga.

Mac-2-DOS will not activate if it cannot detect the presence of a Mac-compatible drive, so before you boot up, you must hook up. Just plug the adapter into your Amiga's drive port (or into the pass-through connector on your external drive) and connect your Mac drive into the adapter.

Now, boot with Workbench and put the Mac-2-DOS floppy in any drive. To install the program on a hard disk, simply drag the Mac-2-DOS icon over the desired directory or drive.

Using the CLI or a file-copy utility, copy the program to the desired drawer. Copy a MacFloppy.device driver to the DEVS: directory on your Workbench disk, and finally, edit your startup-sequence to Mount the Mac.Floppy device as MF0:.




Mac-2-DOS's interface is straightforward, and everthing is explained very clearly in the manual.

*—Ted Goldberg*
*New York, NY*

Once the software locates a Mac-compatible drive, a split display appears on screen. With a Macintosh-formatted disk in the Mac drive, you will see Mac files listed on the left side of the display and Amiga files on the right. A menu bar across the top gives access to the pull-down menus.

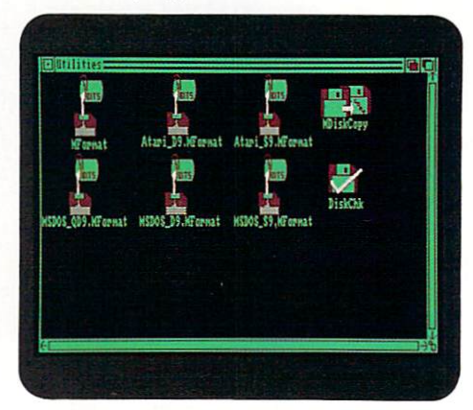
You select files for converting—either from AmigaDOS to Mac format or vice versa—by clicking on them. Next, select one of five file structure conversion processes: MacBinary (for importing Mac programming code into the Amiga), ASCII (for exchanging data between any applications programs that support the ASCII standard), PostScript (for direct PostScript conversion), MacPaint-IFF (for graphics), or no conversion (for straight data conversion). Clicking on the Copy arrow in the middle of the screen starts the process.

This ability to convert file structures makes Mac-2-DOS extremely flexible and distinguishes it from other DOS converters. Most such utilities change the disk format, not the data format, so you often end up with unwanted characters in a converted file.

While conversion of text and data results in files whose source format is indistinguishable, graphics files are different. Mac-2-DOS does not retain colors in converting graphics. While color transfer is planned for an upgrade, for the time being, regardless of how many colors your IFF image has, it will appear monochrome when switched to Mac format—even on the Mac II. MacPaint images converted to IFF format are beautifully detailed when displayed as hi-res four-color images.

For Mac file maintenance, the program allows you to format, verify, rename, and even eject disks on your Mac drive. Similarly, you can rename files, retrieve file information, include icons in your file conversions and display Mac text files.

Mac-2-DOS multitasks nicely and works fine with my 68020 board. It is one of the most complete, user-friendly file-conversion systems I have used. I encountered only one problem using it. With only one internal floppy drive on my A2500, the external drive's default designation is DF2:. The absence of a DF1: rendered Mac-2-DOS's interface inoperative when connected to the external unit. I had to disconnect the external drive and plug the Mac-2-DOS drive



**CrossDOS handles a variety of dialects.**

adapter directly into the Amiga's drive port whenever I wanted to use the Mac drive. Using it on a stock A2000 with two internal drives posed no problem.

While it is costlier and more elaborate than most DOS-conversion systems, Mac-2-DOS is also faster, more reliable, and more flexible. It is a must-have item wherever timely sharing of data between Mac and Amiga systems is essential.

### OTHERS TO CROSS

CrossDOS speaks a different language than Mac-2-DOS. It tackles the easier task of transferring data from AmigaDOS to MS-DOS and Atari ST formats, and vice-versa. CrossDOS has different customs, too. It is a disk-format conversion utility as opposed to a file-conversion program. CrossDOS converts both 3.5-inch and 5.25-inch floppies, as it supports the nearly forgotten Commodore A1020 5.25-inch disk drive.

Consisting of one non-bootable disk and a small spiral-bound manual, CrossDOS qualifies as a no-frills package. You will want to keep the manual close at hand until you memorize the installa- ►

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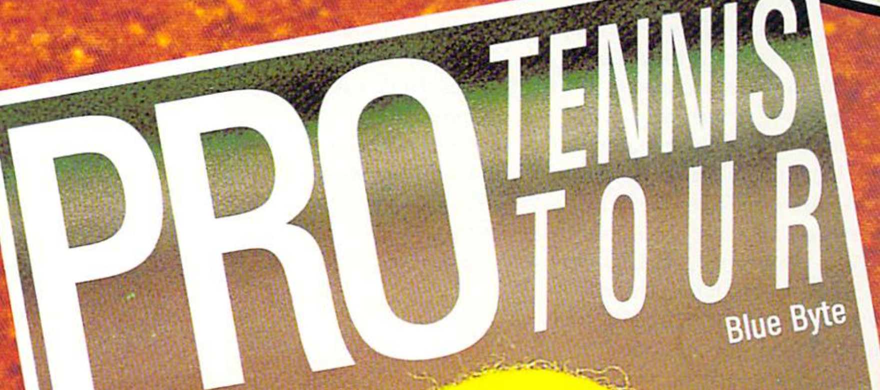



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With CrossDOS, I can use Amiga commands to access MS-DOS data.
*—Glenn Everhart*
*Concordville, PA*

CrossDOS provides a way to be media compatible with MS-DOS, while not object-code compatible. I would like to see more products like it.
*—William M. Perkins*
*Richmond, VA*

tion procedures, command syntax, and conversion process.

Hard-drive or floppy installation poses no problem, even for novices. Just double click the InstallMSDOSFS icon, and click repeatedly on the Continue screen gadget to keep the process moving. I recommend you avoid the Cancel gadget; any time I clicked on it during installation I got either a software error message or one of various crashes.

Installing the program produces a software-based MS-DOS drive named DI0 in your hard disk's DEVS: directory or on a work disk of choice. Unfortunately, accessing DI0 is not so simple; every time you want to mount DI0 (actually DF0:) with CrossDOS installed, you must enter "MOUNT DI0: FROM DEVS:mountlist.msdosfs" into the CLI. Once you do this, though, an icon will appear on screen as soon as you place an MS-DOS formatted disk in DF0:. (MOUNT_JDS files allow for the recognition of additional disk drives on the Amiga.) You can manipulate and copy files to and from the MS-DOS disk through the CLI, and treat it as an AmigaDOS drive.

The system's major limitation is its incompatibility with high-density (1.2- and 1.4-megabyte) floppies. You can create MS-DOS text files without returns (CTRL-Ms) at the end of each line by adding a left bracket to the MS-DOS destination file name. You can also specify whether or not to copy icon information.

A Kill program ensures that all memory resources used by CrossDOS are freed up when you deactivate the program. Another significant option is MFORMAT, which creates MS-DOS and Atari formatted disks on your Amiga drive. MDISKCOPY copies MS-DOS files on DIO, and DISKCHK verifies the integrity of any disk, regardless of format.

Spoiled by Mac-2-DOS's refined interface, I found CrossDOS challenging to use until I had committed its procedures to memory. Still, CrossDOS is unquestionably the best utility I have seen for reading from and writing to 3.5-inch MS-DOS disks on the Amiga. Even Bridgeboard users will find CrossDOS a good investment, as the Bridgeboard by itself offers no 3.5-inch MS-DOS disk support.

**Mac-2-DOS**
***Central Coast Software***
424 Vista Avenue
Golden, CO 80401
303/526-1030
Package A: $99.95
*Macintosh-compatible disk drive required.*
Package B: $349.95
*No special requirements.*

**CrossDOS 3.05b**
***Consultron***
11280 Parkview
Plymouth, MI 48170
313/459-7271
$30.00
*No special requirements.*

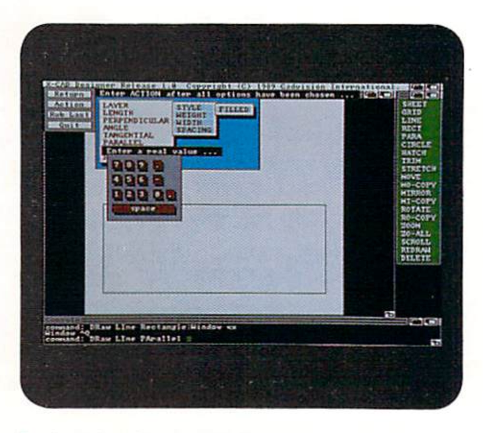
## X-CAD Designer

*Good CAD cheap.*

**By Ronald J. Bissett**

OF THE THREE Amiga CAD programs in its price range, only X-CAD Designer has the power, depth, and speed to compete in the world of professional engineering design.

Designer is a scaled-down, revamped version of the original X-CAD from Taurus Software. Although X-CAD was the most powerful design program the Amiga had ever known, it had a number of problems, including a difficult-to-learn interface and a confusing manual. The UK's CadVision International, the original developer, has regained control of the product now, and has divided it into two offerings: X-CAD Professional, a



**Designer's simple interface makes it easy to use.**

high-end package, and the lower-end Designer.

### Off the Block

While the original X-CAD required a meg and a half of RAM just to boot, Designer runs nicely on my single-drive, one-meg A500.

Designer carries over the dongle, plus those features that made the original X-CAD the envy of many PC users: viewports, zooming, and scrolling. Few programs on the PC side support viewports (sheets with definable sizes and scales). Those that do limit the number (usually to 10 or less), and prohibit overlap. Designer accommodates 32 viewports with individual scales, each of which can be resized, moved, and overlapped. Because objects can be drawn full size in real dimensions within a viewport, you can superimpose several drawings of different scales on one data file, and auto-dimension all of them in real units. The Display Zoom and Scroll commands, which let you zoom in or move around in a drawing while executing another command, give an incredible boost to productivity.

In addition to the original hi-res mode, Designer offers a medium-resolution mode to relieve the eye strain caused by flickering. The manual has been rewritten and includes a complete index. The tutorial provides a step-by-step introduction to the program's basics.

### Screening Room

The new default screen is much like that of Generic Cad and AutoCad on the PC: ►

The full drawing is bordered by menus and always visible. You can easily change the screen color from its default (white), but there are only eight colors to choose from. Unfortunately, the program's 256 layers are not as useful as they could be because only one color can be assigned to a layer; it would be nice to have a different color for each.

In place of the original version's confusing interface, Designer offers pull-down menus. What an improvement this is, especially for the novice! Now the command chains are understandable, the options are clear, and the working speed increased.

To the right of the screen is a vertical Menu Strip, which lets you create customized interfaces for efficient work in specific applications. This Menu Strip replaces the original ScreenMenus customizing environment, and Designer does not allow the import of ScreenMenu interfaces created in X-CAD. Defining Menu Strips is the best way to become familiar with X-CAD's command structure, and is a piece of cake compared with creating ScreenMenus. By creating them, you can customize operations for efficiency. In the original version, you could shut down the primary interface to speed command execution on screenmenus. I am sorry this feature was not included for Menu Strips.

You can operate Designer via the command line at the bottom of the screen. Designer's command-line window asks for specific input: While X-CAD simply asked for three locations to define an arc, Designer asks for origin, start, and end points specifically.

The Comptab command, which allowed the use of a digitizing tablet, has been removed.

### On the Line

What a surprise when I drew a line. The original X-CAD digitizes the screen not directly under the crosshairs, but up and to the left one pixel. Designer, however, is right on the mark! Exploring the rest of the commands and modifiers was a pleasant experience as well. A new draw command, which creates arrows, is very handy for notes. Further, you no longer need to enter a colon after each command in order to execute.

The IDENTS (Interactive Digitized ENTity Selection system) for each draw function are intact except for the near IDENT, and most of the powerful text commands and modifiers are retained. Unfortunately, only one font is available and there is no provision for adding others. Text files cannot be loaded into Designer as was possible in the original. The new Draw Label option lets you type in a text string complete with leader line and arrow.

The Symbols menu is complete and offers one powerful new command—Update Symbol—which automatically redraws a rendering to reflect changes to the symbols library.

Once you enter your data into the drawing database, the task of dimensioning is very easy. It is also amazingly versatile. Six types of dimensions and a multitude of modifier options are available. Autodimensioning is also a great way to check the accuracy of the drawing database.

While CadVision sacrificed some features in producing Designer from X-CAD, most will not be missed or have been replaced with a better solution. One place changes are noticable, however, is the Plot menu. I thought the original X-CAD's print driver selection was paltry, but Designer offers just two drivers. Although Designer is not a professional-level package, it should have greater plotter support.

I could not get the HPGL plot driver to function properly with a Houston-Instruments DMP-1 plotter at 9600 baud. CadVision suggested setting the serial port to 300 baud, which worked, but ever so slowly. The Epson driver did not work with my RX-80, but did function with the FX-185, and produced fine check prints.

Even with its few shortcomings, X-CAD Designer has no equal in the Amiga realm, and except for its limited text fonts and plot drivers, compares very well with similarly priced CAD programs for the IBM. What's more, learning CAD (an unavoidably lengthy process regardless of program or system) on this program will not limit you to the Amiga, as Designer shares so many commands with CAD programs on other formats. Finally, with the X-CAD AutoCAD DXF file-conversion utility ($199), the program can exchange files with IBM systems in the default PC drawing format. X-CAD Designer is a great buy for the power and depth it delivers.

American Software, X-CAD Designer's US distributor, states that both Designer and the original X-CAD are upgradeable to Professional. For technical support, you must either call CadVision in England or purchase a US phone-support option.

**X-CAD Designer**
***Cadvision International Ltd.***
London, England
1-603/3313
***distributed by American Software Distributors***
RR 1 Box 290
Bldg. 30
Urbana, IL 61801
217/643-2050
$149.95
*One megabyte required.*

## QuickShot Robotarm

*Elbow your way into robotics.*

**By Bruce Jordan**

IMAGINE YOURSELF THE owner of a small manufacturing concern. You have orders for a new type of widget. After entering the customer's blueprints into your Amiga, you adjust the design and give a command. Suddenly, automated milling equipment begins to hum with the sound of production.

This scenario is really not so far-fetched. While Datel's QuickShot Robotarm is little more than a toy, it just may be a portent of things to come.

Besides the yellow plastic Robotarm, the package includes two joysticks, an interface box, and a disk containing the robot-driver program. The arm is surprisingly sturdy. From its black suction-cupped base to its formidable-looking forceps (pincers), it stands nearly two feet tall when fully extended. Five rotation axes make the arm agile and able to assume almost any position within a



Could you use an extra arm?

wide radius about its center. Power comes from four D-cell alkaline batteries.

Besides the forceps, there are two other manipulators: a shovel like the one on the Mars Viking Lander, and a switchable magnet for picking up small metallic objects. None of these instruments pack bone-crushing power, but they do provide sufficient force for manipulating small objects.

The joysticks allow for manual (sans Amiga) manipulation of the arm, and for controlling the arm while in program mode. They plug into the base of the arm, and each controls two of the five axes of motion; the fire buttons control the opening and closing of the forceps.

To use the Robotarm with your Amiga, plug the two small connectors of the interface box into the Robotarm's joystick ports, and the opposite end of the interface into your Amiga's parallel port. Next, plug one of the joysticks into the Amiga's second mouse port and power up the computer. Boot with the Datel disk, and the driver program loads automatically.

A set of on-screen gadgets look and work like tape-deck controls. Using these controls, you can record the motions of the arm and play them back. To begin the recording (programming) process, click on the Record gadget and use the joystick to move the arm. The F1 and F2 keys toggle between the various axes, and thus allows you to access all five axes via one joystick. When you have finished your maneuvers, click on Stop or press the F5 key, then click on Rewind. Selecting the Play gadget starts the Robotarm executing the motions you programmed.

### Arm Wrestling

Ironically, it's more fun to use the Robotarm with the joysticks than with the Amiga. The package lacks the flexibility that would make it perfect for experimenting with robotics, and is not quite the learning tool that the packaging makes it out to be. Plus, it has problems.

After just a few repetitions of any programmed motion, the Robotarm wanders off its path rapidly. Known in robotics as hysteresis, this tendency to wander is caused, in the Robotarm's case, by too much slop in the drive train. This slack does not allow the positioning scheme (counting tenths of seconds) to work effectively. What's needed is a good set of position sensors.

Because of a software glitch, certain joystick movements will record, but will fail to cause movement of the Robotarm. Another disappointment is a lack of information on how to control the arm with a programming language. Without being able to to use the Robotarm from ►

within, say, Amiga Basic programs, the creative process for the beginner goes out the window. Calls to Datel concerning programming ended in England. I was instructed to write, and am still awaiting a reply. (I have compiled a list of some hints for those interested in experimenting with robotic control; call or write to *AmigaWorld* for details.)

An interesting sidelight is that the interface box, consisting of 10 transistor switches, is so straightforward that you could conceivably use it for other purposes. With a little wire cutting and soldering, the interface could allow your Amiga to operate a radio-controlled car or plane.

The QuickShot Robotarm is impractical, but so is a chemistry set. If you like machinery, enjoy tinkering, have a good grasp of programming and electronics, don't know when to quit, and hear the call to glory upon reading the words "No user-serviceable parts," then you might find the Robotarm challenging and worthwhile.

**QuickShot Robotarm**
***Datel Computers***
Stoke-on-Trent, England
0782/744707
3430 E. Tropicana Ave.
Las Vegas, NV 89121
702/454-7700
$129.95
*No special requirements.*

## WHO! WHAT! WHEN! WHERE!

## NAG PLUS 3.0

*Just a reminder . . .*

**By Randall R. Greenwald**

WE ARE TOLD that some day we may live in a paperless world. Who! What! When! Where! (WWWW) and NAG Plus 3.0 are two organizational tools eager to move Amiga users toward that day.

### WHY AND HOW

WWWW combines the features of an address and appointment book, calendar, and alarm clock. It can track appointments and responsibilities, provide advance and recurring reminders of upcoming events, and store and retrieve addresses and other information regarding friends and associates.




I use WWWW to keep my life in order. Because of its readily accessible database, I prefer it over NAG Plus.
—*Lewis Tilley*
*Pueblo, CO*

You must install the program on your Workbench disk, which presents a potential problem if you boot with separate disks for different applications. The installation process is mostly automatic, saving you the trouble of tampering with your startup-sequence, but sadly, trouble comes anyway. The installation program asks you to specify storage locations for certain information, but gives no default settings or suggestions of what logic to use in making such decisions.

Once installed, WWWW knows you as an owner. You can protect your data with a password and share it with other owners. The base of operations is your directory, and filling it is much like compiling a standard address book. Entering data is time consuming; no provisions are made for duplicating (so you can keep separate records for members of one family without retyping) or for foreign addresses. You can search any field—except the birthday field—for any string, so as to print mailing labels for select people, for instance.

It is a shame that a product such as this sporting an ARexx port does not provide macros to import data from established ARexx-compatible database programs such as Superbase Professional (Precision) and Microfiche Filer Plus (Software Visions). ►

# ACTION!

*Slick up your joystick it's hot!*

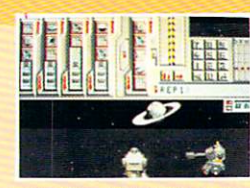
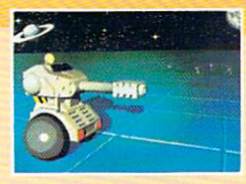


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20432 CORISCO STREET,
CHATSWORTH CA 91311
818-709-3693

Circle 17 on Reader Service card.

## DARK CENTURY

YOU CONTROL THE GREATEST HIGH-TECH TANKS IN THE WORLD. YOU ARE ON A PRISON PLANET TRYING TO ARREST SOME ESCAPED CONVICTS. PROGRAM AND LEAD YOUR TEAM OF TANKS TO TRICK YOUR OPPONENT! RAY TRACED 3D UNIVERSE, MULTITASKING, ONE OR TWO PLAYERS ARE THE FEATURES OF THIS GAME.

## KNIGHT FORCE





YOU ARE THE SWORD MASTER, DEFENDER OF BELLOTH REALM. QUEST THROUGH FIFTEEN LEVELS AND FIVE ERAS OF MAGIC GRAPHICS. LEAD YOUR ENCHANTED POWERFUL WEAPONS AND SPOIL THE MALEVOLENT TRAPS, TO LIBERATE THE PRINCESS TANYA FROM THE CLAWS OF RED SABAT THE SORCERER.

## WILD STREETS




A SUPERCOP AND A BLACK PANTHER TEAM TOGETHER IN A HIGH RISK MISSION. "A TOP CIA AGENT HAS BEEN KIDNAPPED, FIND HIM! YOU KNOW THAT ACTION AND FIGHTING IS INEVITABLE". YOU'LL HAVE TO VISIT THE CITY SLUMS TO FIND HIM AND PROTECT YOU BOTH FROM MOBSTERS, PUNKS AND OTHER RIFF RAFFS.

## F40 PURSUIT




AT THE WHEEL OF YOUR FABULOUS FERRARI F40, YOU'RE RACING AGAINST TIME AT 200 MILES PER HOUR. PLAN YOUR ROUTE, BUT BEWARE OF POLICE THAT WILL TRY TO STOP YOU IN YOUR MISSION. 360 DEGREE SPINS, AND REALISTIC 3D ROAD JUNCTIONS WILL MAKE YOU SENSE THE THRILL OF SPEED. DON'T JUST TAKE OUR WORD, BURN SOME RUBBER.

## OFF SHORE WARRIOR

YOU ARE AN OFF SHORE WARRIOR AND YOUR FIRST ARENA, FULL OF FANS, IS WAITING FOR YOU. STRUGGLE AGAINST ROCKS, WAVES AND OPPONENTS IN A DEADLY GAME. ONLY FEW CAN LEAVE ALIVE. DO IT OR DIE!!!

## FIRE AND FORGET

FACE THREE LEVELS OF SIX CONFLICTS, FROM SPORADIC WARFARE TO TOTAL WAR. NEVER LOOK BACK! IT COULD BE YOUR LAST MISSION. ONE OR TWO WARRIORS CAN TEAM UP.

## CRAZY CARS

YOU ARE RACING FOUR OF THE MOST PRESTIGIOUS CARS IN THE WORLD'S CRAZIEST RACE THROUGHOUT THE UNITED STATES. PREPARE TO START, READY? GO!!!

## TITAN

MAKE YOUR WAY THROUGH THIS STRATEGIC PUZZLE OF EIGHTY WORLDS WITH YOUR MAGNETIC CONTROL UNIT. BUT BE CAREFULL, THE ULTRA-FAST SCROLLING HAS ALREADY CAUSED SOME MENTAL BREAKDOWNS.

As you enter appointments, the programs link them to individuals in your directory. You can specify when to be reminded of appointments and how. Appointments can be set to repeat daily, weekly, biweekly, monthly, or yearly. (If you choose the birthdays option from the Preferences menu, any birthdays in your directory will be entered as yearly appointments.) Reminders can be a simple screen flash and text window or an elaborate combination of a flash, bell, Amiga voice, and any of several digitized sounds. They will interrupt any task—as long as you booted from the appropriate disk—whether or not WWWW is running.

"Things to do" are similar to appointments, but are automatically moved to the following day if not checked off on schedule.

The calendar is by far the program's most clever feature. You can quickly summon a display of any month for any year. The calendar displays your appointments and things to do for any day, and you edit these entries with the mouse. You can also print a monthly calendar together with a tabular listing of appointments.

WWWW does not always do its job well. Because there is only one name field, you must enter surnames first for the program to sort alphabetically. On mailing labels, names are printed in reverse order ("Ruth Smith"). When a name shows up in a reminder, however, both the display and the Amiga's voice render it as it appears in the field ("Smith, Ruth").

If you miss a reminder because your computer is not on, WWWW gives it to you the next time you boot. It is likely to tell you at 12:30PM that it is time for your 8:00AM appointment. Advance reminders of a day or more repeat each time WWWW is run. Many windows do not resize, and switching between owners is irritating because directory windows appear and disappear in the process. Also, the manual says you must run the program at least once a week, but does not suggest what to do during a two-week vacation. No product marketed as a time saver should have rough edges and be difficult to manage. It is




I keep the computer on all day and use NAG for appointments. I like to add humor with synthesized voices saying things like, "Calling Dr. Gown!"

*—Dr. Allen M. Gown*
*Seattle, WA*

distressing to have to say that for a product with such friendly customer support.

### HELPFUL HENPECKING

Because it was shareware in an earlier incarnation, NAG is familiar to many veteran Amiga owners. It aims at a more limited purpose than WWWW, and perhaps for that reason, does a better job. NAG Plus 3.0 is basically an appointment book, and unlike WWWW, does not attempt to be a list manager.

While it is complex, NAG is easy to learn. The manual is functional and organized, but for most operations it is unneeded because help windows, accessed by clicking on an item in question, explain almost everything NAG does.

Help windows make installation simple, and once installed, NAG runs without complication. It occupies an unobtrusive icon, which you click once to display your current appointments and a calendar.

To use NAG, you must take some time to insert dates and text. Appointments occurring only once can be entered by editing the appropriate day. If an appointment repeats, you can copy it to other days. Appointments that repeat yearly, weekly, daily, or even "on the 2nd and last Tuesday of every month," are edited to a different file. If a regularly-scheduled meeting is cancelled, you can delete it from the day's events simply by clicking with the mouse.

A unique feature is the ability to attach notes to words and names. To add a note, just click on your selected word, and you will enter the Workbench Notepad. You can retrieve a note by selecting that word again. Because you can easily forget which words have corresponding notes, this function would be of more benefit if the program visibly flagged the words.

As with WWWW, you can choose the time and character of reminders. They can be simple on-screen prompts or outrageous sound and voice interruptions. Take care with the latter. To have your computer break into a drum lick and address you as "Great ruler of the universe" (NAG's default form of address) while you are making an important phone call could be embarrassing.

Reminders interrupt your current task, rush you to the Workbench screen, and restore your original screen once the "nag" is acknowledged. (Both programs let you turn off the reminder feature.)

For those who do not eat and sleep with their computers, the print function becomes necessary. You can set your schedule for a period of days, print it, work from it, and update it later. A helpful addition would be an ability to format print output. As it is, you must accept the default form.

Nonetheless, NAG's strength lies in its flexibility. A wide range of features, from display colors to internal buffer size and file locations, are definable via help windows. NAG is ARexx compatible, and Gramma Software promises that version 3.1, due out by the time you read this, will have increased capabilities that will allow NAG to function as an ARexx manager.

Contrary to the implications of its name, NAG is polite and well mannered. Unfortunately, it is painfully slow. Nearly all operations require a wait. For instance, the program gobbles six seconds going from one page of appointments to the next. Gramma Software's technical support for NAG is helpful and friendly, if unprofessional.

### NO MORE PENCILS, NO MORE BOOKS?

Both Who! What! When! Where! and NAG Plus 3.0 accomplish what they set out to do. NAG comes through with flying colors. Its design shows thought and insight. WWWW, on the other hand, seems to have been rushed out of the oven. You may benefit from these products. Reports of the death of pencils, Post-it notes, and Daytimers, however, are almost certainly premature.

**Who! What! When! Where!**
***Blue Ribbon Bakery***
1248 Clairmont Rd.
Decatur, GA 30030
404/377-1514
$99.95
*No special requirements.*

**NAG Plus 3.0**
***Gramma Software***
17730 15th Ave. N.E.
Suite 223
Seattle, WA 98155
206/363-6417
$79.95
*No special requirements.*

## BAUD BANDIT

## VTX ON-LINE

*Communicating with some extras.*

**By Sheldon Leemon**

THE TRADITIONAL SHORTAGE of commercial telecommunications packages for the Amiga is probably due in part to the abundance of good public-domain and shareware terminal software. While they get the job done, these freely distributable terminal programs usually lack snazzy extras that make the job easier. Two new terminal packages, Progressive Peripherals' Baud Bandit and MichTron's VTX On-Line, fill in some of the gaps.

### BAUD BANDIT

Baud Bandit's greatest strength is its interface. You can access all program functions either via keystroke combinations or by clicking one of the gadgets at the top of the display. There are no pull-down menus, but a large pop-up menu opens when you press the Help key. Phone-book entries can be edited from within the program, so you need not rely on a text editor. These entries make it possible to dial information services and bulletin boards automatically, and to specify communication settings and default file-transfer protocols for each service. Within the upload and download file requesters you can not only select the name of the file to use for the transfer, but also change the transfer protocol.

Baud Bandit is not only easy to use, but flexibile and powerful as well. It supports most of the popular file-transfer protocols—Xmodem, Xmodem 1K, WXModem, Ymodem, Zmodem, and CompuServe B. Only Kermit, a protocol used mainly for communication with mainframe computers, and CompuServe Quick B are absent. The program lets you change the number of display colors, the palette, and the font, and choose whether words will be split at the end of a line, and whether interlace is used. If you use a program like MoreRows to expand the Workbench screen into the overscan area, Baud Bandit will open its screen to the same size. The program supports 30 keyboard macros that allow you to print out an entire phrase by pressing a function key, and execute commands or start ARexx scripts, among other things. ARexx support is fairly complete: most program functions are accessible from scripts. Baud Bandit also supports devices other than the standard Amiga serial device, such as the multiple serial boards and the internal modem available for the A2000. A Chat mode allows on-line conferencing, and a circular review buffer lets you read or print text that has scrolled off the screen, or send it to the Amiga clipboard device for transfer to other programs. The review buffer window, configuration windows, and file-requester windows all function independently without disrupting the terminal window display. Finally, Baud Bandit multitasks well.

Even with all these fine features, Baud Bandit comes up short in some respects. The script language provides the bare minimum required for automatic log in, by reading a list of character strings from the remote source and sending the designated responses. Because these script pairs must fit on one line, their length is strictly limited. This can pre- ►

sent problems. Logging on to some boards through PC Pursuit, for example, requires so many responses as to run up against this limit. The program does not provide conditional or loop commands required for unattended operation. You can remedy this lack to some extent through the ARexx support facility, but because the ARexx commands are not available as script or macro commands, you must purchase the ARexx program to do so. The program allows manual redial, queue dialing, and an automatic redial facility without time control. Baud Bandit supports no terminal emulations other than ANSI (which comes standard with the Amiga), and the manual lacks an index. These points are most relevant to those with serious telecommunications needs, however, and not to the casual bulletin-board user.

### VTX On-Line

VTX On-Line poses a stark contrast to the Baud Bandit, because despite some very professional features, it has a clunky interface carried over from the Atari ST version. There are no sub-menus. Instead, each menu item that has sub-options opens a requester box. That wouldn't be so bad if some of the settings options were combined into one requester, but as it is, there are separate boxes for baud rate, parity, duplex, handshake, and so on. The organization of the menus is poor, also. Communications settings are mixed in with some display settings on a Settings menu, while other display settings reside with terminal-emulation settings and a print-screen function on a menu called VT-100. Item names are among the least helpful I have seen. What does the Undo function on the File menu do? Where do you set the number of data bits? What does Set Character Size do? None of these answers are obvious without reference to the manual, and some aren't covered there.

This is a shame, because VTX On-Line has some great features. Its full-featured script language is similar to, although not as extensive as, those used by Micro-Systems Software's Online! and Crosstalk on the IBM PC. The ARexx port accepts all script-language commands, including those that let you select menu items from a script. It lets you view Compuserve GIF and RLE graphics files while you download them. A Chat mode lets you edit text before sending it and lets you re-send lines without retyping. It has a 64-entry phone directory, and can redial busy numbers automatically. Also, like Baud Bandit, it supports the Amiga Clipboard for sharing text between programs.

Other features elicit a more mixed reaction. VTX On-Line supports just a few terminal emulations, including Tektronics 4014, Prestel (a graphics standard popular in France and not of much use in the US), and ANSI. While you can control some aspects of the display, such as the color palette and use of interlace, there is no provision for overscan, window borders, or changing the number of colors or the display font. The program supports the popular XModem, YModem, Kermit, and CompuServe B protocols, but does not support WXModem (used on PeopleLink), ZModem (which is becoming popular on bulletin boards), or CompuServe's Quick B (which provides faster file transfers). You can program the function keys to output a whole string of characters with a single keystroke, but the program will not let you call one macro from another or from an ARexx script.

The only print option is a screen-print function that displays the contents of a screen as graphics. Outputting text as graphics is extremely slow, and the program comes to a standstill while printing—so much for multitasking. Because the ASCII capture function won't allow you to capture to a file called PRT:, the best you can do for obtaining a hard copy of your session is to capture it to a file, and then print the file. And while the program does display GIF graphics files while downloading them, it displays them in hi-res mode, not the 4096-color mode most GIF viewer programs use for the best picture quality.

Minor problems include a lack of an option to disconnect the phone by dropping the Data Terminal Ready line. The program crashed a number of times while I was manipulating the file requester. VTX On-Line assigns the Fonts: directory when you start the program, but

fails to assign it back when the program terminates. The manual is a mixed blessing as well: It provides detailed technical information, but its introduction to telecommunications is both elementary and incomplete. There is no discussion of logging on, communications settings, or uploading and downloading.

### Parallel Lines

While Baud Bandit and VTX On-Line offer more than the average public-domain terminal program, both offer less than the top commercial communications packages. Of the two, however, Baud Bandit is best for most users. Unless you need a complete script language and a choice of terminal emulations, it will take care of your communications needs with style and ease.

**Baud Bandit**
***Progressive Peripherals & Software***
464 Kalamath St.
Denver, CO 80204
303/825-4144
$49.95
*No special requirements.*

**VTX On-Line**
***MichTron***
576 Telegraph
Pontiac, MI 48053
313/334-5700
$79.95
*No special requirements.*

## Thinker

*Think hypertext!*

**By Neil Randall**

HYPERTEXT, LIKE ITS cousin hypermedia, is one of the most persuasive of recent buzzwords. The goal of hypertext is, essentially, to link databases. In this setup, documents, spreadsheets, and even games become databases, through which you can move simply by clicking on a word.

If you are reading an on-screen document about George Bush in which the author talks about the president attending Baltimore Orioles games, for instance, you can click on "Baltimore Orioles," and through the magic of hypertext, suddenly enter an article about the baseball team. Let's say you discover an interest here in former O's pitcher Mike Flanagan, so you click on his name and move into a database about the Toronto Blue Jays, where Flanagan now pitches. This leads you to information about the Skydome, which takes you to the Astrodome, and then to a chapter on Dallas, Texas, and on, and on. Eventually, you will read about Elvis Presley, because it is to Elvis that all databases ultimately lead.

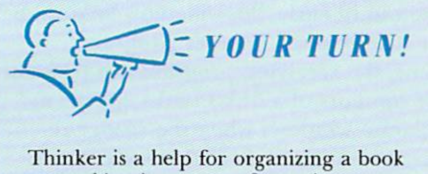
### Dear Reader

In hypertext, the reader, not the author, controls the flow of information. Rather than worry about coherence and internal consistency, then, author's job is to provide optimal links to the same or other databases. Creating these links is what Thinker, by Poor Person Software, is all about.

As the fairly well-designed, 55-page manual tells us, Thinker can link to three things: Thinker documents, IFF picture files, and Workbench applications that have either project or tool icons. (According to Poor Person, version 2.0, due out in early '90, will allow linking to the ARexx ports of other programs. Thus, the receiving program can process the contents of a link.) Links appear in separate windows when the reader requests them, and thus, the writer can bring several items to bear in the creation of a document.

Thinker documents consist of hierarchically arranged paragraphs containing textual links to each other. Placing the proper symbols before each paragraph's name allows readers to move freely between paragraphs, no matter where they occur in the document. Skipping sections does not obligate readers to return to the point at which they requested a link, although they can.

To the writer, there is little difference between linking to a paragraph within the same document or to one in a different Thinker document. Any word or words can be set up as a link item. To provide access to another Thinker document, simply specify a path to the reference in brackets. For example, <documents:doc1,chevrolet> tells Thinker to ►




Thinker is a help for organizing a book or working in stream of consciousness.
*—H. Dennis Odell*
*Baytown, TX*

link to a section called chevrolet in a document named doc1 on the Documents disk.

### WRITE ON

When you write a Thinker document you essentially create an outline. Let's say you are writing an article about the Amiga. You begin by outlining as much as you can, with your most important statements at level one and lesser ones below. If your two major topics are hardware and software, you would place "disk drive" under the former and "Amiga Basic" under the latter, and then continue subordinating to as many levels as you wish.

In the article's introduction, you will use the most important terms, then fully explain each in later paragraphs. Someone reading the introduction can click on the term "disk drive" and be taken directly to the section you named "disk drive." Within that section you might mention a schematic drawing of a drive—an IFF file you have included on disk. If a reader clicks on the drawing reference, the picture will pop up. After viewing the image, the reader can return to the introduction or go on to another topic cited in the current section.

All elements within Thinker assist in the creation of documents. You can mark sections for editing, choose the number of levels that will appear on the screen, allow jumping to various points in the document, import text from ASCII files, and build an index. A read cache speeds up screen updates somewhat, and all commands are accessed by the mouse, not the keyboard.

Thinker is not as pretty as the Mac's HyperCard, nor does it employ that product's stack metaphor. Moreover, assembling Thinker documents is not as entertaining as creating HyperCard stacks. But Thinker is a start, and will certainly whet a lot of HyperAppetites.

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## THE VAULT • A590 • HD-500

*Three driving machines.*

**By Louis R. Wallace**

LIFE IS GETTING harder. It's true. There are more Amiga hard drives on the market now than ever before. Among the newest are The Vault from Progressive Peripherals, Commodore's A590, and the IMtronics HD-500. All these install externally on the Amiga 500, and one, The Vault, is also compatible with the A1000. While these three drives have a number of similarities, they also differ in significant ways.

### THE VAULT

The Vault uses a PC-style RLL controller, and has an internal power supply. The unit we received contained an ST238R 30-meg hard disk that, when formatted, provided 32 megs of storage. A 12-inch interface cable extending from the back of the hard drive connects to the A500's expansion bus. (This interface also works with an A1000 without adjustments.) The cable is not a problem if you set the drive alongside the computer, but if you have a monitor stand over your A500, you may find that the cable is too short to allow comfortable positioning of the drive.

The manual's step-by-step instructions make installation and setup easy, even for first-timers. The supplied disk includes the installation program, plus ►



**Drives in a row: (l to r) the A590, The Vault, and the HD-500.**

Progressive's file-management utility, CLImate. Booting from a copy of the disk presents you with the Utility Manager, which allows you to partition and format your drive just by pointing and clicking.

After formatting, the program copies all necessary Workbench files from the floppy to the hard disk, and then modifies your installation floppy to make it suitable as a hard-drive boot disk. The newly created startup-sequence transfers control to the hard disk on boot up so you will not need the floppy again. Setting up was simple—even on a single-drive A500.

Evaluating read and write speeds with DiskPerf 2.0 and PerfTest (two standard Amiga hard-disk benchmark programs) proved The Vault to be sluggish. Initially, it read data from the disk at about 100K per second, and wrote at 25K per second. I was particularly surprised by these times because I had selected FastFileSystem (FFS) when formatting with the Utility Manager. Going back to the Utility Manager, I repeated the partitioning and formatting process (making sure to select FFS), reinstalled the Workbench files, and repeated the tests. I got the same results. Still convinced that something was awry, I formatted the disk manually using AmigaDOS—specifying FFS—and modified the mountlist for the FFS partition so it would conform to FFS partition requirements. Then I rebooted and repeated the performance tests. This time, The Vault's read time improved by about 65K per second (write times, however, did not change appreciably).

Reading data while displaying an overscan screen was difficult for The Vault: with PerfTest, I timed reads at 30K per second; write times did not change.

My biggest gripe about The Vault is its lack of ability to autoboot—an option available on most hard disks today. The Vault is adequate, but unexciting.

### A590

Commodore's entry into the Amiga 500 hard-disk market is not just a drive, but an expansion box. Inside the A590's case are a 20-megabyte hard disk and a RAM expansion device.

Installation is fairly simple: Just push a small grounding clip onto the base of the computer at the expansion bus opening, and slide the A590 onto the bus. The external power supply is designed to be placed on the floor under your desk; it connects to the back of the drive via a long cable. If you are using Workbench 1.3 with a Kickstart 1.3 ROM, you can set a dip switch to allow for autobooting. If you do not have the 1.3 ROM, boot from a floppy.

Getting started is a snap because Commodore formats the drive with the FastFileSystem, Workbench, and Extras. If you want to customize the drive, you can re-prep, partition, and format the A590, and re-install the system software using the supplied software.

The A590 boots directly to FFS and does not require an AmigaDOS partition, as did Commodore's early A2000 hard-disk controllers. All information on partitions and disk size is stored on the drive using the Hardblock techniques introduced with the 1.3 operating system.

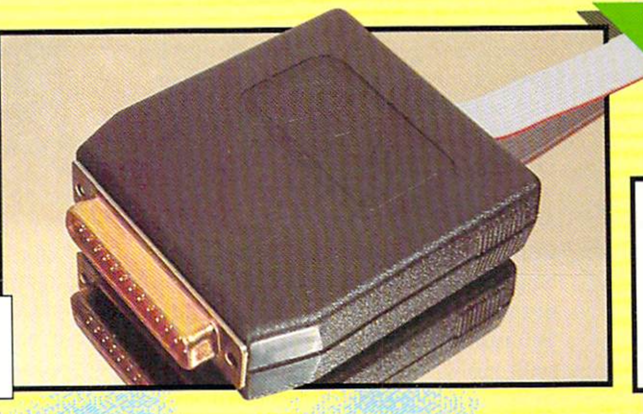
Commodore designed the A590 to use inexpensive PC-XT drives (which is what it is shipped with), but you can add a second drive via the external SCSI port. Sockets on the motherboard allow you to install up to two megs of RAM. While RAM installation is well documented, it involves disassembling your A590 and removing the hard disk, so you may want to turn the job over to a dealer.

Once I was up and running I repeated the performance tests I had used on The Vault and discovered that while the A590 reads at speeds comparable to The Vault (around 150K per second), it writes much faster than The Vault (about 95K per second). Controller speed is not affected significantly by overscan displays; with PerfTest's overscan option, ►

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read times dropped to 130K and write times came in at 80K.

I am pleased with the A590. While it does not come with a high-performance hard disk, it is reliable and suffers very little from the effects of overscan.

### HD-500

I am also pleased with IMtronics' HD-500 hard-disk system. It installs easily onto the A500's expansion bus, has an external power supply, and supports autobooting for systems equipped with 1.3 Kickstart ROMS.

The 32-meg unit comes formatted with the FastFileSystem. Getting started is easy: Just slide the drive on the bus, plug in the power supply, and turn everything on. The drive autoboots quickly, going directly to Workbench. (Also in IMtronics hard-drive lineup is a 45-meg HD-500 and the HD-4000, a drive with sockets for four megs of RAM.)

Using DiskPerf 2.0 and Perftest to check read and write speeds, I found that the HD-500 is among the fastest A500 hard drives available, and by far the fastest of the three compared here. Read times came in around 300K per second and writes averaged 220K per second. While the HD-500's performance decreases significantly when an overscan screen is displayed (Perftest with overscan turned in reads of 105K and writes of 82K), even then it fares better than most A500 hard disks.

The HD-500 case fits snugly beside the A500. Although it is not as slick in appearance as the A590, it is the same height as the computer, so using it does not involve finger bumping. The HD-500 is my favorite of the bunch. It installs easily, autoboots, and performs well. Plus, it's reasonably priced.

### Hard Decisions

There are at least 10 hard drives on the market for the A500, none of which is the clear-cut "best." (See p. 31 in the July '89 issue for a comparison of seven others.) Not only do the units' prices vary, but their performance and expandability differ too. The trick is to make a list of your current and anticipated needs, and to compare what's available.

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# B A C K T A L K

CANDID RESPONSES TO *AMIGAWORLD* REVIEWS

### Minimegs (MAST)

In his comparison of memory expansion devices for the Amiga 500 (see p. 60 in the November '89 issue), Lou Wallace stated that lack of a pass-through connector on the Minimegs cartridge limits expansion possibilities. To say that a user cannot expand his system because he has a Minimegs on the bus is incorrect, as Minimegs can plug in to the outside of a device with pass-through.

***—John Griffits***
*MAST*

*In a hardware session at the 1988 developers conference, Commodore representatives stated that the A500 bus is designed to support one expansion device only and that they do not recommend daisy chaining peripherals from it. The Commodore-approved method of adding more than one device to the bus is via a chassis with buffered backplane. Therefore, even though Minimegs is well designed and would probably work connected to the pass-through of another device on most A500s, I cannot in good conscience recommend this expansion method.*

***—Lou Wallace***

### Pat on the back

I like the *AmigaWorld* Reviews section. It gives me the information I need about a product before I go out and spend money. Your reviewers are experts in my eyes.

***—Troy A. Witt***
*Irvine, CA*

### OverDrive (Pacific Peripherals)

I have a real concern with the use of the new "Your Turn" section. By your own admission, you had one response (concerning OverDrive) to your request for comments, and the one you got was from a disgruntled customer who dealt with us over a year ago (see Dec. '89, p. 121). We are so confident of our customers' satisfaction that we now offer an unconditional guarantee on OverDrive.

***—Lee Adams***
*President*
*Pacific Peripherals*

I have been using an OverDrive since April 1988, and am getting tired of the undeserved bad press it has been getting. My OverDrive is hooked up to two hard drives, a total of 170 Megs, used as storage for the A.M.U.G. BBS. It is not only extremely reliable, but multitasks better than any other controller I have seen.

***—Joe Rothman***
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*About the author*: Rob Peck is one of the most respected and knowledgeable leaders in the Amiga community. Rob wrote the ROM Kernel Manual, the bible of Amiga developers. Rob is also the author of Programmers Guide to the Amiga and numerous magazine articles.

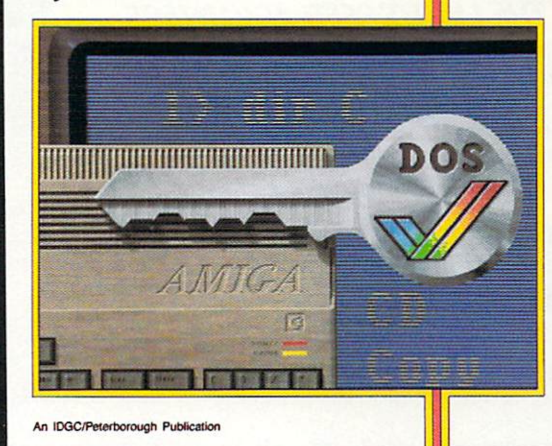
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| Dr. T's Editors (ea) | $99 |
| Dynamic Studio | $129 |
| M | $129 |
| Midi Magic | $115 |
| Music-X | $199 |
| **PixSound** | **$55** |
| Synthia | $65 |
| Texture Quest I | $99 |
| Texture Quest II | $169 |

## GRAPHICS & ANIMATION

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|---|---|
| **ANIM Fonts** | **$32** |
| Animation Station | $65 |
| Butcher | $25 |
| Digi-Paint III | $65 |
| Director | $45 |
| Director Toolkit | $27 |
| Elan Performer | $39 |
| Fantavision | $45 |
| Grabbit! | $21 |
| **Homebuilder's CAD** | **$129** |
| MovieSetter | $65 |
| MovieClips | $23 |
| Photon Paint II | $99 |
| Pro Video GOLD | $199 |
| Pro Video Fonts (ea) | $85 |
| Sculpt 3D-XL | $129 |
| **Starship 2050** | **$32** |
| Turbo Silver | $129 |
| Turbo Silver Terrain | $27 |
| **TV*Text Professional** | **$115** |
| Ultra Design | $249 |
| X-CAD Designer | $99 |
| **X-CAD Professional** | **$329** |

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|---|---|
| **Starboard II (500 or 1000)** | **$215** |
| **Upper Deck** | **$49** |
| **Multifunction Module** | **$69** |
| **Starboard SCSI Module** | **$99** |

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| **Benchmark Modula-2** | **$129** |
| C Library | $65 |
| IFF Library | $65 |
| Simplified Library | $65 |
| C.A.P.E. 68K Assembler | $59 |
| DSM (Disassembler) | $45 |
| DevPac Amiga (HiSoft) | $65 |
| G.F.A. BASIC | $89 |
| HiSoft BASIC | $105 |
| Innovatools I or II | $55 |
| J-Forth | $129 |
| **Lattice C 5.0** | **$225** |
| Lattice C++ | $269 |
| M2Amiga Modula-2 | $165 |
| M2Amiga Source Debugger | $85 |
| Magellan | $129 |
| Manx Aztec C Devel | $199 |
| Manx Aztec C Pro | $129 |
| Manx Library Source | $199 |
| Manx Source Debugger | $79 |
| Powerwindows | $59 |
| **Software From Hell** | **$55** |

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## HARDWARE & ACCESSORIES

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| 8-Up! PopSIMMs (4) | $65 |
| **Insider II 0MB/2MB A1000** | **$225** |
| Spirit Inboard 1000/500 | $259 |
| Supra 0MB/8MB A2000 | $159 |
| **Supra 2MB/8MB A2000** | **$349** |
| Supra 4MB/8MB A2000 | $519 |
| Supra 6MB/8MB A2000 | $699 |
| Supra 8MB/8MB A2000 | $889 |
| **Supra 512K A501 Compatible** | **$95** |

### GRAPHICS HARDWARE

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|---|---|
| AProDraw 12x12 Tablet | $465 |
| 12x12 w/Cursor | $499 |
| Color Splitter | $89 |
| **Digi-View GOLD** | **$139** |
| flickerFixer | $479 |
| **FrameBuffer w/Capture** | **$629** |
| Panasonic Camera w/Lens | $249 |

### SCSI HARD DRIVES

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|---|---|
| **Quantum 40MB 3.5"** | **$499** |
| Quantum 80MB 3.5" | $849 |
| uantum 105MB 3.5" | $949 |
| **quest 44MB 5.25"** | **$759** |
| 4MB Cartridges | $115 |

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| **AMAS MIDI/Sampler** | **$119** |
| CMI MIDI-1 | $59 |
| ECE MIDI | $49 |
| MIDI Gold 500 | $59 |
| MIDI Gold 2000 | $65 |
| **MIDI Star 2*6** | **$225** |
| Perfect Sound 500 | $69 |
| Perfect Sound 1000 | $79 |

### A2000 CONTROLLERS

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|---|---|
| GVP Impact 0MB/2MB | $319 |
| **HardFrame** | **$229** |
| Overdrive | $145 |
| **Supra WordSync** | **$169** |
| Trump Card | $175 |

### SUPRA DRIVES

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|---|---|
| SCSI Controller A500 | $169 |
| **2MB RAM for A500 SCSI** | **$275** |
| SCSI Controller A1000 | $209 |
| **Supra 20MB A500** | **$499** |
| Supra 30MB A500 | $639 |
| Supra 45MB A500 | $729 |
| Supra 60MB A500 | $849 |
| **Supra 80MB A500** | **$999** |
| **A1000 versions, add** | **$80** |

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|---|---|
| Gen One | $525 |
| Magni 4004 or 4004S | $1495 |
| **MiniGen** | **$219** |
| SuperGen | $649 |
| **SuperGen 2000S** | **$1495** |
| **VidTech ScanLock** | **$875** |

### MISC. HARDWARE

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| A-MAX 128K ROMs | $139 |
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| Boing! Optical Mouse | $99 |
| CMI Proc Accel 1000 | $199 |
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| **Enhanced Unidrive** | **$149** |
| **Gravis MouseStick** | **$85** |
| GVP 3001 w/4MB RAM | $2599 |
| **GVP 3001 w/4MB/40MB Dr.** | **$3099** |
| M-4 Mouse | $39 |
| **MW738 A500 Power Supply** | **$89** |
| UniDrive | $129 |

**Call for hardware shipping rates.**

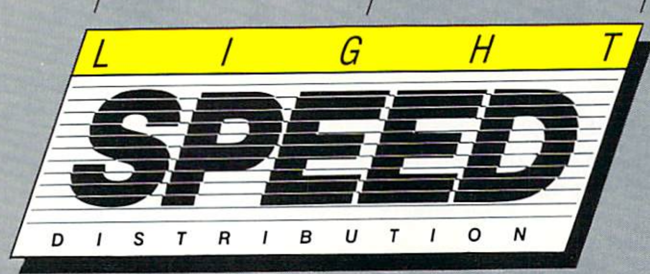
### ACCESSORIES

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| **AmTRAC Trackball Mouse** | **$69** |
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| Cordless Joystick | $12 |
| **Mouse Master** | **$27** |
| Power Player Joystick | $21 |
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### BOOKS

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| AmigaBASIC Inside & Out | $19 |
| **Amiga Graphics In & Out** | **$26** |
| **Amiga Hardware Manual** | **$20** |
| Amiga Programmer's Guide | $19 |
| C for Beginners | $16 |
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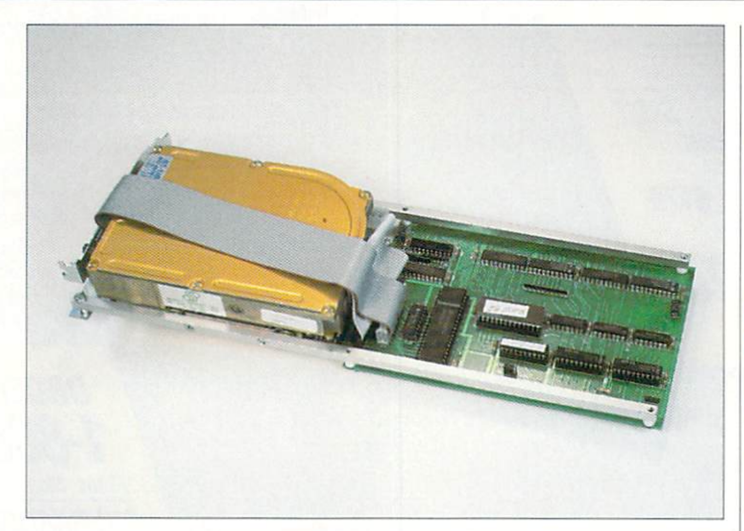
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**Compiled by Jan Jackson**

## Hardly

SUPRA'S **WordSync**, a SCSI hard-disk interface for the A2000, promises to match the speed of any DMA unit by transferring two bytes of data on each cycle instead of one, and by using custom circuitry to synchronize the transfers. The half-size card features a SCSI expansion port and is compatible with Commodore's Bridgeboard, RAM boards, and digitizers. WordSync also supports Commodore's Hard Block Specifications, Workbench 1.3, Autobooting, and the Fast File System. You can buy the interface in kit form ($199) and add your own hard disk, or as part of a Supra Drive hard card in 30MB ($649), 45MB ($749), and 80MB ($1299) configurations. Get the word on WordSync from Supra Corporation, 1133 Commercial Way, Albany, OR 97321, 503/968-9075. *RS# 502.*



## Presenting

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## Visuals

**ANIMATION STATION** ($99.95), an OpCode-5 standard Anim editor, provides a storyboard interface that gives you word processing-like control for editing animations. The program lets you cut, paste, and otherwise manipulate animations and IFF frames via the mouse. You can select any number of frames simultaneously for viewing, editing, or generating the thousands of special effects provided.

The latest version of the real-time color digitizer **FrameGrabber 2.0** lets you print images directly from the software. The update provides freehand-brush support of any image, supports multiple file formats (including DV21, IFF, IMG8, RGB, RAW, and IFF24), and comes with a color wheel. FrameGrabber retails for $99, but current registered users can upgrade for $49.95. For FrameGrabber 2.0 or Animation Station, your next stop should be Progressive Peripherals & Software Inc., 464 Kalamath St., Denver, CO 80204, 303/825-4144. *RS# 504.*

## And Then Some. . .

For compact but roomy hard disks, M.A.S.T. (1395 Greg St., Sparks, NV 89431, 702/359-0444) suggests its revised *Tiny Tiger Two* line of SCSI hard drives featuring Fujitsu 45 ($799), 90 ($1199), 136 ($1499), and 182 ($1749) megabyte SCSI mechanisms with 20-millisecond capabilities and a 64K on-board RAM cache. A 30-megabyte *Budget Tiny Tiger* with a Seagate drive is available for $599. *RS# 505.*

*ImageLink*, a full-color imaging and multi-format image-conversion system, provides direct support for Truevision Targa series videographic boards. You can control ImageLink via ARexx for batch jobs, external control, and for developing turnkey systems. The program supports color quantization and reduction as well as dithering. To improve your image, reach Active Circuits Inc., 106 Highway 71, Suite 101, Manasquan, NJ 08736, 201/223-5999. *RS# 506.*

Run A2000 expansion boards from your A500 or A1000 with *AX-S Expansion System* from Supra (1133 Commercial Way, Albany, OR 97321, 503/967-9075). AX-S connects to the Amiga's 86-pin expansion bus and sports a 200-watt power supply, ventilation fan, plus seven slots including XT/AT bus and multiple peripheral drive bays. Prices vary according to equipment selections. *RS# 507.*

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| • Cal. Access | 139.95 |
| • FDATA-10 | 119.95 |
| • FDATA-20 | 249.95 |
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| 30 MB | 599.95 | 649.95 |
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| 80 MB | 979.95 | 999.95 |

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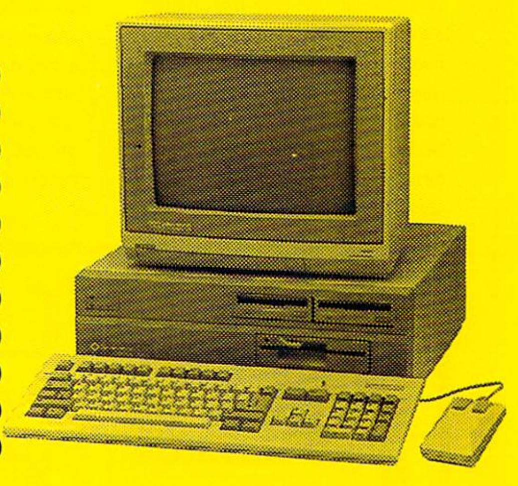
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edits automatically from a 1000-entry edit decision list. The system lets you overlay titles and graphics, create wipes, fades, disolves, and digital special effects, and transfer computer animations to videotape.

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And they're off! *Omni-Play Horse Racing* ($49.95) takes you to the track where you and up to three of your friends can play the ponies. You can define tournament rules, purchase tips from competitors, and place bets. The SportTime game is distributed by Broderbund, 17 Paul Dr., San Rafael, CA 94903-2101, 800/521-6263. *RS# 509.*

What does the future hold for you? Maybe you can find out with the *Tarot Master* fortune-telling program. An on-disk tutorial incorporates animation sequences to help you define and read the cards yourself. Curious? Direct your energies toward Empire Graphics, PO Box 964, Union, NJ 07083, 201/964-7865. *RS# 511.*

So you want an easy way to write applications that harness the Amiga's power? Invite *AMOS* over to your place. While Mandarin Software (Europa House, Adington Park, Adington, England SK104NP, 0625 878888) introduced the program as a games-development tool, you can use it to create other types of software as well. Amos is more than a construction kit—it includes the usual BASIC commands plus some specialized ones to let you make the most of the Amiga's hardware. *RS# 512.*

Tune in to SunRize Industries' (PO Box 1453, College Station, TX 77841, 409/846-1311) *Perfect Sound 3.0* digitizer, now with a revamped interface and additional tools. With 3.0, you can apply a low-pass filter algorithm to sampled sound for digital filtering and adjust input volume without touching a knob. English-language versions retail for $99.95; French and German are also available. *RS# 513.*

Britannica Software (345 Fourth St., San Francisco, CA 94107, 800/572-2272) wants to challenge you with *Jigsaw! The Ultimate Electronic Puzzle.* You can piece together 13 scenes with eight levels of complexity, and import pictures to turn into puzzles. *RS# 514.*

Desktop publishers, animators, and videophiles, *Pic-Magic* ($85), a clip-art resource library, offers over 250 images in IFF format on 10 disks. According to Joe's First Company (208 Glenayr Rd., Toronto, Ontario, Canada M5P 3C3, 416/322-6119), some images are designed to draw the eye to a certain spot, and others intend to convey a mood. *RS# 517.*

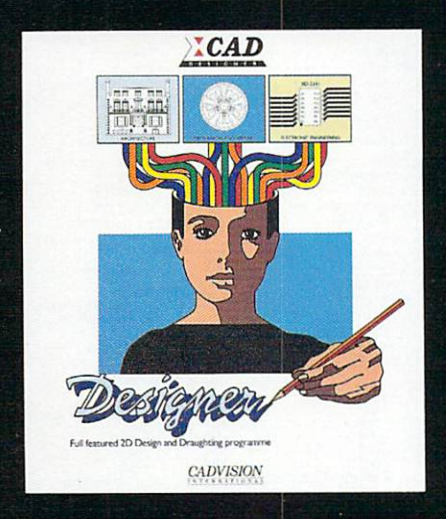
Fourteen new fonts are included on *InterFont 1.2* (Syndesis' 30-text design and format conversion package) making a total of 20. This latest version also includes the new Professional Draw Converter for use with Gold Disk's draw and destop-publishing programs. InterFont retails for $119.95 but owners can upgrade for just $10. Contact Syndesis (N9353 Benson Rd., Brooklyn, WI 53521, 608/455-1422) for more information. *RS# 515.*

Xerox 4020 Color Ink Jet Printer owners: The *GlassCanvas Printer Driver* ($24.95) lets you print from light to dark via Preferences density control and supports all seven densities, as opposed to only two with the Workbench 1.3 driver. GlassCanvas Productions (PO Box 6171, Boston, MA 02114, 617/367-3229) uses dithered palettes to create up to 128 colors in hi-res and up to 512 shades in lo-res mode. *RS# 516.* ■

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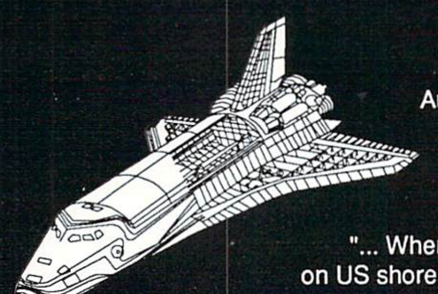
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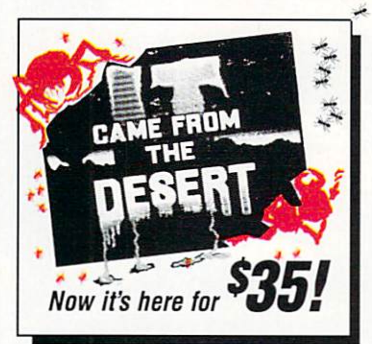
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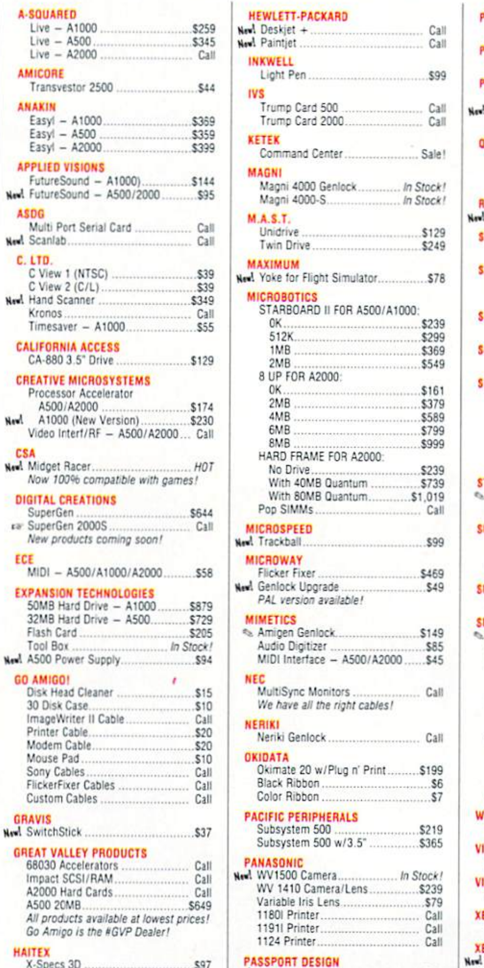

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*Circle 54 on Reader Service Card*

# HELP KEY

*With a whole new decade of technical troubles ahead, what would we do without Lou?*

**By Louis R. Wallace**

## BASIC Pictures

**Q:** *Can I load and display a picture (such as one from Deluxe-Paint or Digi-Paint) onto a BASIC screen using BASIC? If so, can I write text that can be altered over the same screen using BASIC?*

***B. Trego***
*Chesapeake Beach, MD*

**A:** You have several options for displaying IFF pictures (such as those from Deluxe-Paint) under BASIC program control. On your Amiga Basic Extras disk, the program LOADILBM demonstrates a method of loading a picture from BASIC. While slow, it could work, especially if the program was compiled. Another method is to use a machine language routine to load the screen for you. One such routine is the public-domain IFF library (available as IFFLIB161.ZOO on most BBSs and commercial networks), which you can use from Amiga Basic. A final option is to convert the IFF pictures to Amiga Basic BOBs using one of the many public-domain BrushToBob programs. Then, load the image as a BOB from your BASIC program.

Digi-Paint pictures are HAM (4096 color) mode and will probably prove too exotic to be used from Amiga Basic. I suggest you stick to Deluxe-Paint images for your project.

## The 128 Route

**Q:** *I have text files from my Commodore 128 word processor and I would like to convert them for use on my Amiga. Is transferring them via telecommunications the best way? Is there a simple way to get these files to the Amiga?*

***J. McNamara***
*Orinda, CA*

**A:** You can use telecommunications to transfer the files, but keep in mind you are working with CBM PETSCII files, not pure ASCII text files. C-64 and C-128 ASCII is a special form of ASCII called PETSCII (after the Commodore PET). If you load these files into an Amiga editor, they will usually look like garbage. You need to process them using a PETSCII-to-ASCII file converter before (or after) you transfer them.

If you have a 1581 disk drive for your C-128, I suggest you get ReadySoft's C64 Emulator (v. 2)—not for the emulator itself, but for a handy utility on the disk called Transfer. This program allows your Amiga to read a 1581 disk, copy files from it to the Amiga, and automatically make the PETSCII/ASCII conversion. Just copy all your files to the 1581 disk, then use Transfer to copy them to the Amiga.

## A Home for PD

**Q:** *The best place to start PD programs that can be run in the background is from the startup-sequence, but where in the startup sequence? Can I use the StartupII file or should I leave it alone? Also, when I run VirusX it causes df0: to make terrible grinding noises. Why?*

***C. Maxey***
*Stillwater, OK*

**A:** The first lines in your startup-sequence should be commands, such as SETPATCH, FASTMEMFIRST, and BINDDRIVERS. If you are booting from a hard disk, you should next include the ASSIGN statements you need to work from that drive. From then on, the sequence of instructions in your startup file is mostly a personal decision based on your needs. You can easily start VirusX 3.2 at this point by adding the command VIRUSX to your startup-sequence. (I suggest you have VirusX in your C: directory.) StartupII can certainly be customized with special commands and functions.

VirusX automatically checks each disk inserted into a floppy drive for boot block virus infections, and will warn you if it finds a specific virus or a non-standard boot block. Your drive shouldn't make grinding sounds, unless the disk in the drive has some sort of problem, such as hard disk errors.

## Laser Longing

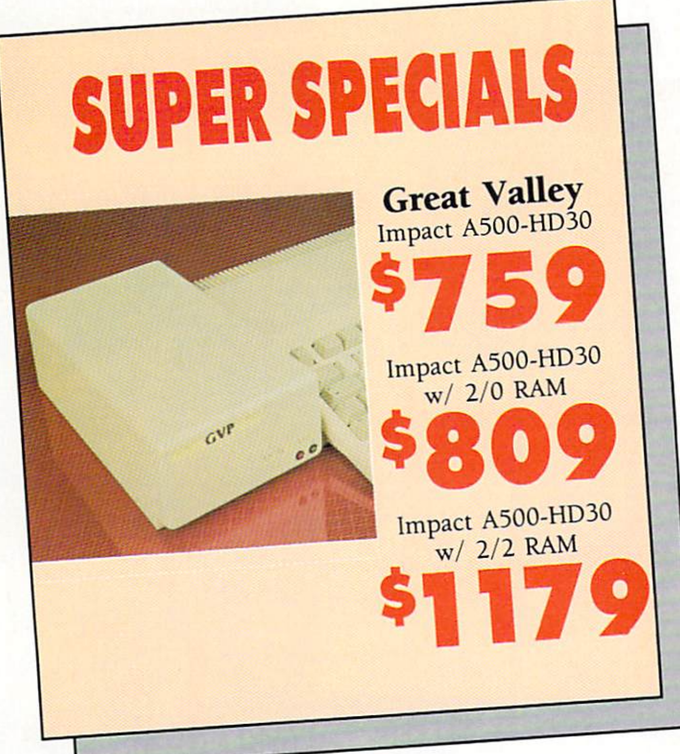
**Q:** *I am the only Amiga owner on the faculty of Tallahassee Community College, and I am surrounded by maniacal Mac and IBM users. Can I do a project on my Amiga then print it on their laser printers? I am considering A-Max and DOS-2-DOS. Will these programs help?*

***R. Deshaies***
*Tallahassee, FL*

**A:** The programs will certainly help. If your colleagues are using Macs, and you have A-Max (ReadySoft) or MAC-2-DOS (Central Coast Software) and a Mac disk drive, you could copy your Amiga files to the Mac disk and use one of their Macs to output to a printer. To work with MS-DOS-based machines, you could use DOS-2-DOS (Central Coast Software) or one of Commodore's PC Bridgeboards (the A2088 for the XT; A2286 for the AT) to get your files over to a PC disk, then go to a PC with a laser printer, and output from there.

If your department has several computers tied into one laser printer using an ABCD box (which has multiple 25-pin input ports and a switch to select which one is active), you could simply connect your Amiga to that system. ■

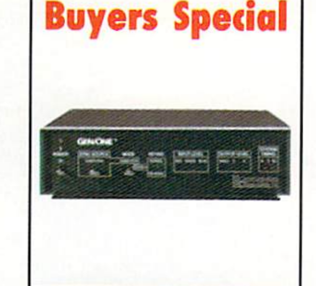
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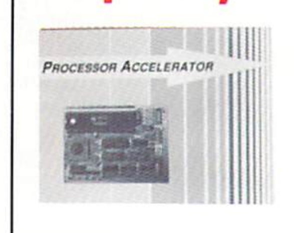
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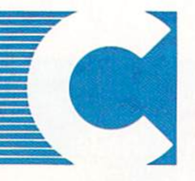
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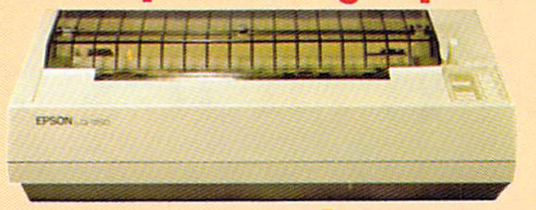
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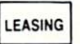
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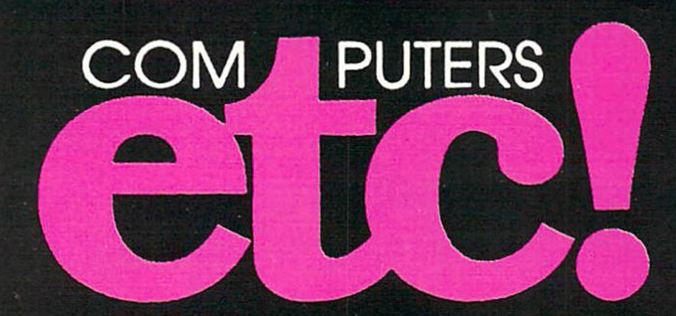
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| Item | Price |
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| ST-277N-1 60 MEG | 619 DEL |
| ST-296N 80 MEG | 629 DEL |

### Quantum Pro Drive

| Item | Price |
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| 40 MEG SCSI Pro Drive | 619 DEL |
| 80 MEG SCSI Pro Drive | 869 DEL |
| 100 MEG SCSI Pro Drive | 949 DEL |

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## Hard Drive Cards (A-2000)

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| Item | Price |
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| ST-177N 60 MEG NEW ! | 699 DEL |

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## Quantum

### Pro Drives

| Item | Price |
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## XETEC Fast Card

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| Item | Price |
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#### Quantum Pro Drive

| Item | Price |
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Briwall Price -- $33

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### Bride of the Robot

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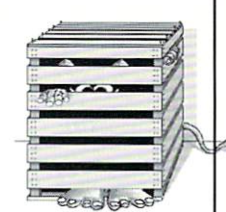
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| A1000 | Starboard2 256Kx1 150ns | $269 | $337 | $416 | $496 | $621 | n/a | n/a | n/a |
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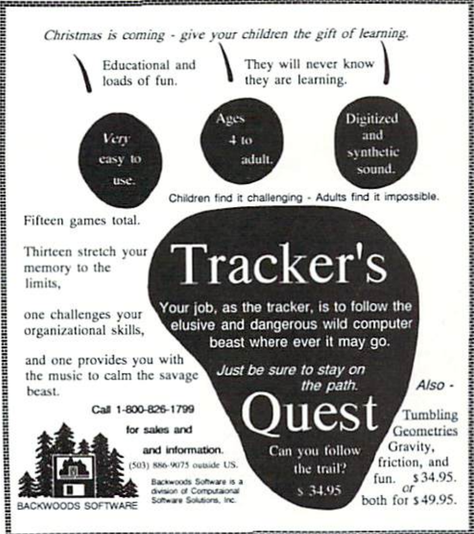
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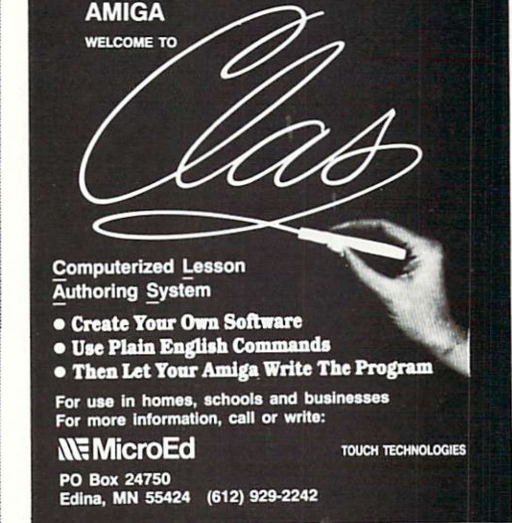
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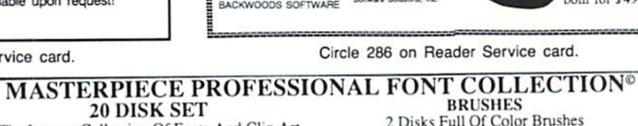
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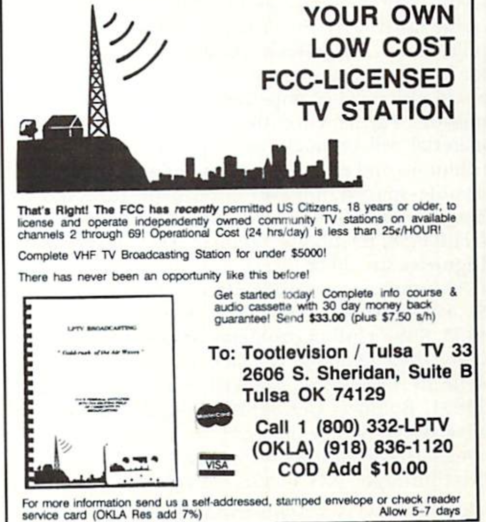
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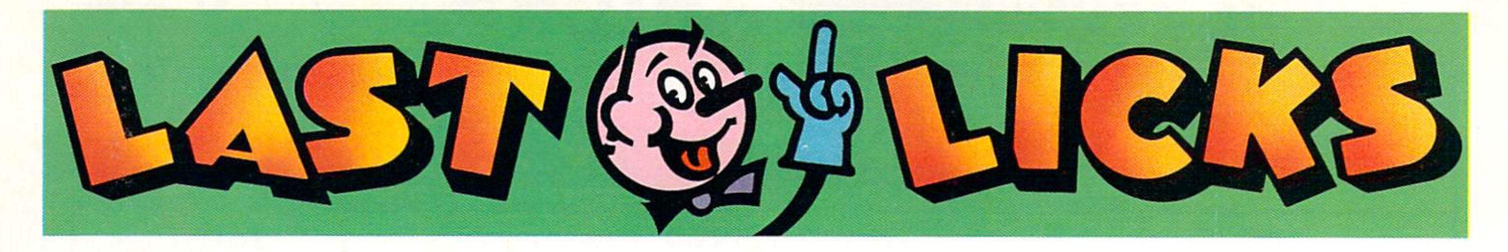
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"I haven't seen a single TV or print ad . . . I'm glad to see they're advertising . . .

*Glenn Hembree*
*Mobile, Alabama*

"I thought they were pretty well done (TV ads) except that they were aimed more towards entertainment . . . any publicity is good . . . it would be nice if they pushed (the machine) more toward business applications."

*Thomas G. Hewitt*
*Ann Arbor, MI*

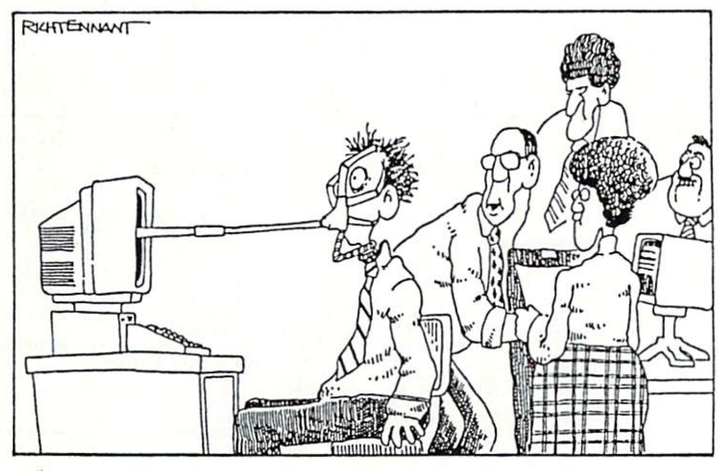
"It's about time (Commodore) has done something . . . we had an (Amiga dealer) in town and he finally gave up because no one knew what an Amiga was."

*Paul Nanna*
*Bozeman, MT*

"Actually I haven't seen the ads . . . I haven't seen any ads since the ones for the Commodore 64. Many people seem to think that (Commodore) keeps jumping around with its product line and discontinuing good products."

*Tom Kinsey*
*Springfield, Missouri*

*WANTED!*
We could use your help: Are there any burning questions you would like to ask your fellow Amiga users? Send them and any comments or concerns to Last Licks, c/o *AmigaWorld* Editorial, 80 Elm St., Peterborough, NH 03458.



"ALRIGHT, STEADY EVERYONE. MARGO, GO OVER TO TOM'S AMIGA AND PRESS ESCAPE... VERY CAREFULLY."

# Ear to the Wall

**Commodore Moves on Unix**. Look for Commodore to make some moves into the workstation market this Spring with 68030 machines running Unix, a gangly, overrated operating system developed by AT&T. The Unix market is currently divided into two camps, AT&T and Sun Microsystems pushing one brand, and IBM and DEC pushing another. Hedging its bets, Commodore reportedly plans to support both versions.

**The password is multi-media** . . . Barring unforeseen glitches, Gold Disk should have launched three new products by the time this issue hits the streets: Advantage, a spreadsheet with ARexx capabilities; Notebook, billed as a "junior hypercard" featuring video capabilities for "basic multimedia applications"; and the piece de resistance, Show Maker, which simultaneously loads and displays Anim files. "The main feature is you can put together a video and edit it at the same time," explains Gold Disk's David Jones. The program lets you synchronize visuals to your sound track by frames per beat. By adjusting the tempo, you can accelerate or slow down your animations with external MIDI devices. Loop an animation as many times as you like and it will stay synchronized.

Another soldier in the multimedia campaign is Al Hospers, Chief Executive Officer at Dr. T's Music Software. "We feel the Amiga is the computer best positioned to take advantage of the new surge in multimedia, and we plan to be a part of it." Dr. T's Keyboard Controlled Sequencer (KCS) version 3.0 includes support for SMPTE time code with their new synchronizer box, Phantom SMPTE, that lets you sync compatible video and music software to audio- or videotape.

Dr. T's also plans to unleash their integrated graphic editor, TIGER Cub, for the Amiga, bringing graphic "piano roll" display and editing capabilities to KCS. The program was designed as a real-time musical data editor. With it you can edit notes and controllers individually, as part of a range, or in arbitrary independent groups. TIGER Cub lets you view up to three tracks of music at once and store up to ten display configurations for recall. Also on Hosper's musical palette, Tunesmith, an algorithmic composition program, offers support for up to six voices of MIDI output, real-time control, and KCS integration.

# So What. . .

**In the Macintosh world, when the going gets dull, the dull create a new buzzword. In this case, Apple and its cronies coined the term "multimedia," and quickly got everyone from *Businessweek* to *Newsweek* foaming at the mouth.**

**At first, multimedia seems like something new. That is, until you look more deeply and realize that it is little more than desktop video, an old concept for Amigans.**

**Still, these vendors and journalists keep falling all over themselves in praise of Apple and multimedia. Here are some of the sillier examples. *Newsweek*, in a cover story called "The Innovators," reports that Macromind (a Macintosh developer) "Developed the first software package that allows owners to assemble elaborate shows of animation, sound—even video and special effects—at home on PCs." Gimmee a break! The Macromind director costs $695 and requires a $10,000 Macintosh system to work properly. The Amiga has The Director from The Right Answers Group; it costs $69, and can work just fine on a $1500 Amiga with genlocking. Macromind should change its name to Micromind.**

**Like every good buzzword, the pundits have jumped on multimedia. Just in time, really, because they had been running out of column ideas and were recycling badly. In the September 1989 issue of *Infoworld*, the otherwise astute Ruthann Quindlen blathered on about multimedia, first asking if it is real, and then stating that it does not exist, and finally arguing that multimedia for the masses is "a good ten years away."**

**Come down to earth. Multimedia is nothing more than mixing various forms of expression, such as video, animation, text, static graphics, sound, whatever. A no-brainer for the Amiga.**

**But vendors babble on, giving well-covered speeches about the future of multimedia. And each time they do, we should all laugh a little bit harder.**

***—Doug Barney***



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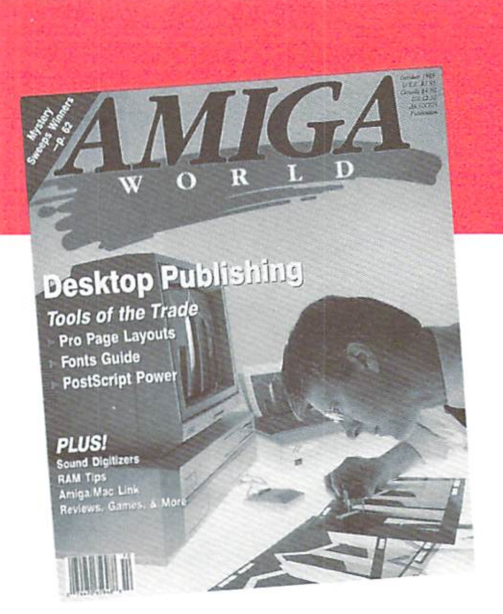
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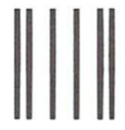
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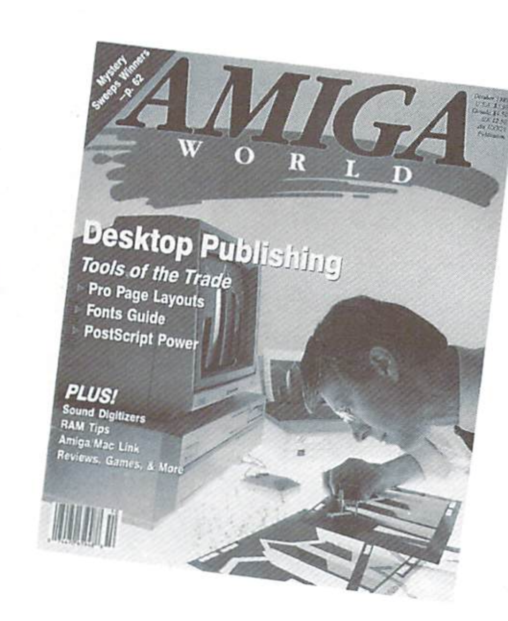
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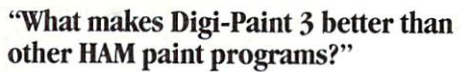
## What Makes Digi-Paint 3 the Ultimate Paint Program?

*"Finding the best paint program for your Amiga can be confusing, but once you have the facts it's simple."*

Laura Longfellow
Sales Manager
NewTek Inc.

### "Why is Digi-Paint 3 better than DeluxePaint III™?"

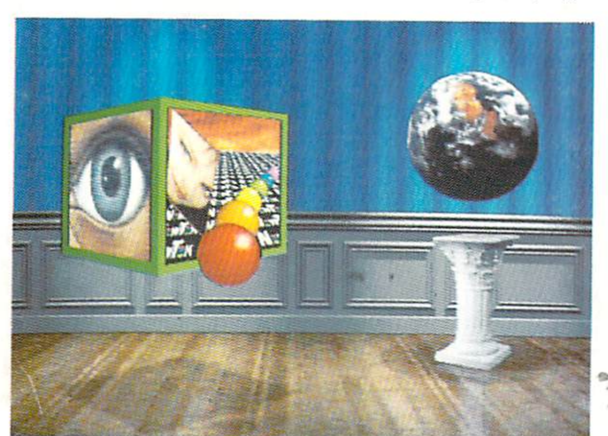
Digi-Paint 3 works in the Amiga's powerful Hold And Modify (HAM) mode, which allows you to paint using all 4096 colors simultaneously. By comparison, Deluxe Paint III (by Electronic Arts) operates in less sophisticated modes, restricting you to a maximum of only 64 colors. Advanced features available in Digi-Paint 3 – including Colorizing, Variable Transparency, Shading, Lighten, Darken and Range Painting – are simply not possible in Deluxe Paint III due to its 64 color limitation. AMIGAWORLD warns, "Competitors may want to head back to the drawing board, because Digi-Paint 3 is hard to beat!"



### "What makes Digi-Paint 3 better than other HAM paint programs?"

Digi-Paint 3 is the only Amiga paint program written in 100% assembly language. Although challenging to program (taking up to 10 times longer than other computer languages), it's the only way to achieve the incredible speed found in Digi-Paint 3. AMIGAWORLD calls it "the fastest HAM paint program yet" and AMIGA SENTRY estimates it's, "6-10 times faster" than the nearest contender.

Other advanced features found *only* in Digi-Paint 3 include: anti-aliased texture mapping, anti-aliased fonts, ARexx support, 1024 x 1024 super bitmaps with auto-scrolling and dithering to 30 bits per pixel (over a billion colors internally, giving you tens of thousands of apparent colors). COMPUTER SHOPPER magazine reports "Digi-Paint 3 is without a doubt the most advanced HAM paint program to date!"






### "But is Digi-Paint 3 easy to use?"

I've learned that no matter how powerful a program is, if it's not friendly it's not worth my time. We designed Digi-Paint 3 with all users in mind – from the beginner just starting out with computers, to the "power user" who demands the most advanced features possible. The spiral-bound manual contains a step-by-step Guided Tour, 11 hands-on tutorials, a color coded reference card, and almost one hundred example photos.

Digi-Paint 3's intuitive user interface was created by Digi-View designer (and NewTek Founder) Tim Jenison and renowned Amiga artist Jim Sachs. It features innovative "Dashboard" controls which AMIGAWORLD regards as "a joy to use" and "very easy to learn and understand". INFO MAGAZINE says the new interface "looks great and works logically".



### "What is the Transfer 24 program included with Digi-Paint 3?"

Transfer 24 is a separate program disk included in the Digi-Paint 3 package, allowing you to alter any picture's brightness, color saturation, contrast, hue and sharpness, almost as easily as adjusting the controls on your television set. Transfer 24 also lets you modify the size, palette, and resolution of any picture. These powerful features, known as "Image Processing", give you incredible control over your final artwork. You can also save your image in any of the Amiga's 24 resolution modes (up to 768x480) making it compatible with all Amiga graphics software. AX MAGAZINE notes that "Transfer 24 gives you even more options as to the final appearance of your work". AMIGAWORLD declares, "Transfer 24 is great for making overall changes."

### "What technical support does NewTek offer?"

Digi-Paint 3 has one other thing you won't find in any ordinary paint program: a toll-free help line. If you should have any questions while using Digi-Paint 3, you're not on your own. Call NewTek's technical support team at 1-800-736-7617 Monday through Friday, 8 am -7 pm Central Time.

Digi-Paint 3 is available now at your local Amiga dealer or call **1-800-843-8934** or **1-913-354-1146.**

Circle 119 on Reader Service card.

